ESKORT Designer for Clearance

User Guide, Section II - Environment

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

DOCUMENT

Title:	User Guide, Section II - Environment
Document:	icdk/Application/Designer/UG/2
Date:	2010.11.17
Version:	1.9
Author:	Marco Dijkstra, Jørgen Rune Mortensen
Contributions by:	Christoffer Børrild, Daniel Simonsen
Classification:	Confidential
Distribution:	

Versions:

1.4 Converted to single source
1.6 Updated on input from Spanish translators
Added details to section 2.4.3.5
1.7 Footer changed to Intracom
1.8 Updated description of period keys
1.9 Added section describing Template Infos.

Printed:	16.05.12

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Table of Contents

1. Overview 1

1.1 Conventions 1

2. Environments 2

2.1 Overview 2
2.2 Environment Contents 2
2.3 Creating an Environment 3
2.4 Cube Definition 4
2.4.1 Introduction 4
2.4.2 Understanding Cubes 4
2.4.3 Defining a Cube 6
2.4.3.1 Creating a Cube 6
2.4.3.2 Creating Dimensions 7
2.4.3.3 Creating Period Dimensions 16
2.4.3.4 Static Period Dimensions 17
2.4.3.5 Creating Members 18
2.4.3.6 Adding Members to a Static Period Dimension 21
2.5 Extract Definition 23
2.5.1 Introduction 23
2.5.2 RecordXML Source (mapping of XML-elements into cubes) 24
2.5.2.1 Keys for target cube (Mapping fields to dynamic dimensions) 27
2.5.3 Field (Defining measures for the static dimension) 31
2.5.4 ProvideKey attribute (identification of registration numbers) 33
2.5.5 KeySelect Element (identification of registration numbers) 34
2.5.6 RecordTable Element (source of the data) 36
2.5.6.1 RecordTable under Cube Definitions 39
2.5.7 Keys for Target Cubes (mapping fields to dynamic dimensions) 39
2.5.7.1 Converters 43
2.5.8 Field Elements (mapping fields to measure dimension) 45
2.5.9 Where Extensions 47
2.5.10 AssociativeTable Element 48
2.5.10.1 Member Conversion 50
2.6 Data Sources 51
2.6.1 Data Source 51
2.6.2 UrlXmlDataSource 52
2.7 Reference Data Services 53
2.7.1 Simple Map Data Reference 54
2.7.2 Query Mapped Data Reference 56
2.7.3 Ref Data Simple WebService Data Reference 56
2.7.4 Simple JDBC Data Reference 59
2.7.5 E-biscus WebService Data Reference 59
2.8 Client System Facade 60
2.9 Tag Types 62
2.9.1 Creating Tag Type Values 62
2.9.1.1 Tag Type Values 63
2.9.1.1.1 Explicitly Defined Tag Type Values 64
2.9.1.1.2 Implicitly Defined Tag Type Values 64
2.9.2 Template Groups 66
2.9.3 Template Info for associating Template Groups and Cubes 74

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.10 Parameter table 75
2.10.1 Client Control Workspace 77
2.10.1.1 Working with Tab Elements 77
2.10.2 Working with Parameter Tables 78
2.10.2.1 Titles versus Names 78
2.10.2.2 Creating and Editing Parameter Tables 79
2.10.2.2.1 Parameter Tables Child Elements 79
2.10.2.3 Value Columns 80
2.10.2.4 Key Columns 81
2.10.2.5 Client Control 82
2.10.2.5.1 Role Access 83
2.10.2.5.2 Row Titles 84
2.10.2.5.3 Update Conditions 84
2.10.2.5.4 Delete Conditions 84
2.10.2.5.5 Hint 84
2.10.2.6 Parameter Usage 84
2.10.2.7 Client Control for Value and Key Columns 85
2.10.2.7.1 Default Value 85
2.10.2.7.2 Search Filters 86
2.10.2.7.3 Columns 88
2.10.2.7.4 Editors 89
2.10.2.7.5 Common Elements 89
2.10.2.8 States 96
2.11 Libraries 96
2.12 Generic Report for Environments 97
2.12.1 Selecting Information 97
2.12.2 Filtering 97
2.12.3 Hiding or Showing the Controls. 98
2.12.4 Other Features 98
2.12.5 Example 98

3. Environment Verification 99

3.1 Introduction 99
3.2 Environment Verification 99
3.2.1 General Verification 99
3.2.2 Verification of Extract Definition 99

Appendix A: Menu-items, Buttons and Shortcuts 100

Appendix B: Configuration Examples 108

How to Change Names 108
Changing Tab Names 108
Changing Column Names 108
Changing Names in Filter Areas 108
How to Change Default Values 108
Changing Default Values for Result Tables 108
Changing Default Values for Random Selection 109
How to Change Minimum and Maximum Values for Random Selection 109
How to Add a declaration Field 109
Cube Definition 109
Extract Definition 109
How to Add a New Declaration Type 109

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Tag Types 109
Cube Definition 110
Knowledgebase – DetermineBullDeclarationType 110
Knowledgebase – Sad_RiskObject 110
Knowledgebase – SadItems_DefaultValues 110
Simple Map Data Reference 111

°LastInfoPage

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

1. Overview

This document is aimed at establishing a basic understanding of knowledge base environments as well as introducing the related concepts and terminology.

1.1 Conventions

Definitions – The first time a specific term or concept is mentioned in a relevant subsection it is printed in italic. If required, further definition will follow shortly after the first time it is mentioned and is preceded by an icon.

Exercise – Exercises are printed in bold and are preceded by an icon.

[Menu] – Menu options, buttons, window and field names are printed within square brackets. The word option, button, field, dialog/window behind the word will specify the type.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

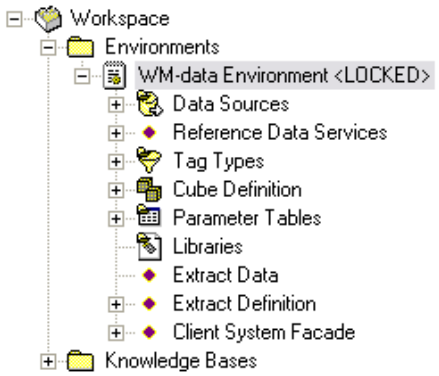
2. Environments

2.1 Overview

An environment is a configuration document representing the combination of data model, Tag Types, Parameter Tables and data sources defining the context or environment in which a knowledge base is being defined. The environment is used to support the knowledge engineering process, and to validate information entered in the knowledge base. The environment base is also used for defining the Graphic User Interface for the ESKORT Clearance Workbench.

2.2 Environment Contents

The following illustration reflects the types of information in the environment:



- Data Sources – names of ODBC and JDBC data sources pointing to the databases where declaration data, reference for the incoming declarations, Parameter Tables and Tag Type values are stored.
- Reference Data Services – services for looking up data for validation
- Tag Types – tag types and their values (defined explicitly or implicitly). These tag types can be used in the filter construct in rules.
- Parameter Tables – table definitions and usages along with GUI definitions for ESKORT Clearance Workbench
- Libraries – Not used in the ESKORT Clearance Risk Analysis System
- Extract Data – Not used in the ESKORT Clearance Risk Analysis System
- Cube Definition – definitions of cubes
- Extract Definition – information about how data should be extracted and loaded into the cubes.
- Client System Façade – Style sheet for preprocessing of the incoming declarations

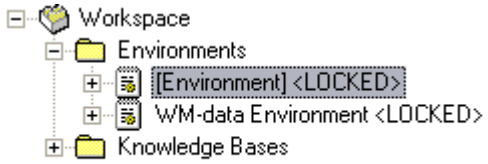
The following sections deal with the above mentioned aspects.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.3 Creating an Environment

A new environment can be created by selecting the [Environment] folder in the structure pane of the Designer and selecting the [New Environment] option in the context menu.

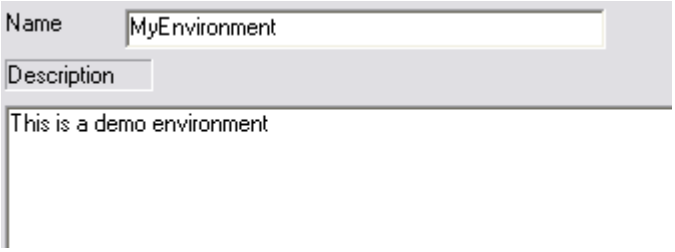
This will result in a new environment to be inserted.



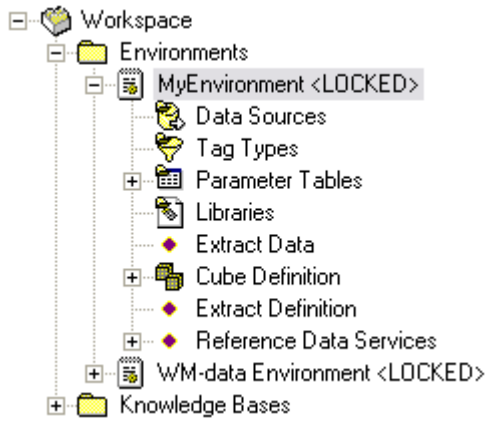
An [Environment] element has the following attributes:

- Name – name of the environment.
- Description - description

See illustration below:



Initially the environment will be empty (although it will show the various element types).



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.4 Cube Definition

2.4.1 Introduction

The declaration data, which is received from the declaration system during the risk analysis process, is organized in a multi-dimensional structure we refer to as *cubes*.

Rules access the declaration data using these cubes rather than directly accessing XML-formatted declarations.

Prior to analyzing a declaration, the Analysis Server will construct and populate the cubes as defined in the referenced environment.

2.4.2 Understanding Cubes

A cube is basically a multi-dimensional way of organizing a collection of related data. To illustrate, let us assume that we have information about a manifest, which is submitting three transport documents.

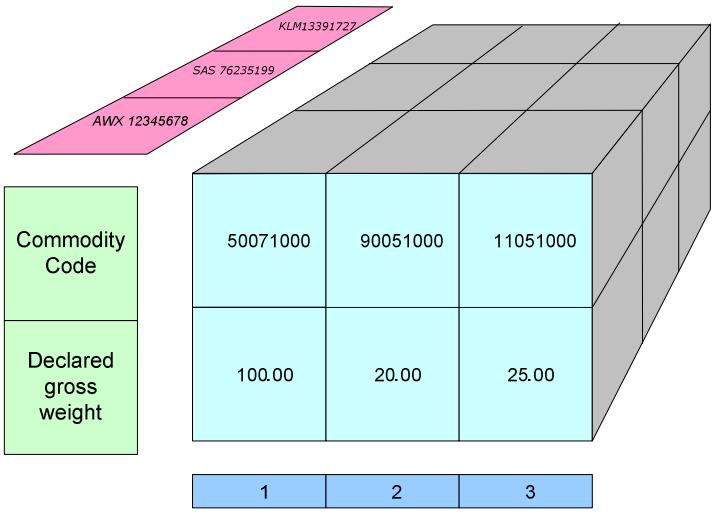
A representation of this information in a tabular view could look something like the following:

Transport document No.	Line of Packages	Declared gross weight	Commodity code
AVX12345678	1	100.00	50071000
AVX12345678	2	20.00	93051000
SAS76235199	1	500.00	11051000
KLM13391727	1	110.00	93051000
KLM13391727	2	18.00	11051000
SAS76235199	2	550.00	22021000
SAS76235199	3	130.00	50071000
AVX12345678	3	25.00	11051000
KLM13391727	3	540.00	22021000

The same data (Declared gross weight and Commodity code) is available for every transport document and line of packages.

Using a multi-dimensional perspective on the data, it could be visualized in the following manner:

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



This multi-dimensional view on data is referred to as a *cube* because of the visual appearance when the view has three dimensions.

The cube is said to be spanned by three *dimensions*:

Transport documents with *members*: 'AVX12345678', 'SAS76235199', 'KLM13391727',

Line of packages with *members*: '1', '2', '3'

and a measure dimension with members: 'Declared gross weight', 'Commodity code'

The measure dimension indicates what has been "measured" (or reported) for each combination of transport document and line of packages.

In practice the cube could be much larger. It could also have more dimensions (or fewer) - although this is difficult to visualize.

The cube is said to be made up of *cells* - corresponding to each ‘measured’ value. Each cell is identified by a *coordinate* listing the combination of members in the three dimensions for which the value was measured.

In other words, another way of perceiving the cube is as a collection of cells, also referred to as a *cell set*. The table below shows an example of that. The first column shows the coordinates, which points out the cells in the cube. The second column shows the values located at the cells (also called the measures).

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Coordinate	Value
{'AVX12345678', '1', 'Declared gross weight'}	100.0
{'AVX12345678', '1', 'Commodity code'}	50071000
{'AVX12345678', '2', 'Declared gross weight'}	20.00
{'AVX12345678', '2', 'Commodity code'}	93051000
{'AVX12345678', '3', 'Declared gross weight'}	25.00
{'AVX12345678', '3', 'Commodity code'}	11051000
{'SAS76235199', '1', 'Declared gross weight'}	500.0
{'SAS76235199', '1', 'Commodity code'}	11051000
{'SAS76235199', '2', 'Declared gross weight'}	550.00
{'SAS76235199', '2', 'Commodity code'}	22021000
{'SAS76235199', '3', 'Declared gross weight'}	130.00
{'SAS76235199', '3', 'Commodity code'}	50071000
{'KLM13391727', '1', 'Declared gross weight'}	110.00
{'KLM13391727', '1', 'Commodity code'}	93051000
{'KLM13391727', '2', 'Declared gross weight'}	18.00
{'KLM13391727', '2', 'Commodity code'}	11051000
{'KLM13391727', '3', 'Declared gross weight'}	540.00
{'KLM13391727', '3', 'Commodity code'}	22021000

The notation used above for coordinates, a comma separated list of enclosed in braces, is taken from the MDC formalization language used when expressing rules.

A ’coordinate’ for which one ore more dimensions are missing is referred to as a *tuple*. Logically the tuple corresponds to a cell set with all the cells with coordinates of which the tuple is a sub-set.

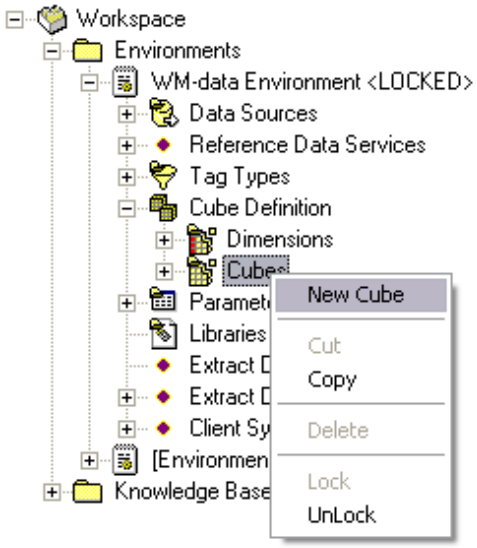
The tuple ...	Corresponds to the cell-set identified by ...
{'AVX12345678', 'Declared gross weight'}	{'AVX12345678', '1', 'Declared gross weight'}, {'AVX12345678', '2', 'Declared gross weight'}, {'AVX12345678', '3', 'Declared gross weight'}
{'AVX12345678', '3'}	{'AVX12345678', '3', 'Declared gross weight”}, {'AVX12345678', '3', 'Commodity code'}

2.4.3 Defining a Cube

2.4.3.1 Creating a Cube

To insert a new cube, make the [Cubes] element the current element and select [New Cube] from the context menu. See the illustration below:

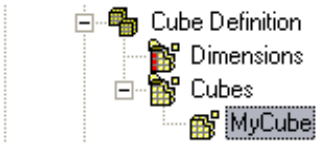
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



A new cube will be inserted.

A [Cube] element has the following attributes:

- Name – name of the cube
- Description – a description of the cube



2.4.3.2 Creating Dimensions

As explained earlier, a cube is said to be spanned by a number of dimensions. As an example let us have a look at the dimensions for the Lines of Packages for Manifests. Typically these are:

- LineOfPackages – Dimension with members that reflects the various registrations of the lines of packages in the declaration.

  The cube must contain the LineOfPackages dimension for a unique identification of the specified Line of Packages within the manifest, typically this is a combination of the 'Lp no' field (a unique identifier for the Line of Packages) and the 'TD key ID' (see next bullet) derived from the Transport document under which the Line of Package is registered.

- TransportDocuments – Dimension with members that reflects the various registrations of the transport documents in the declaration.

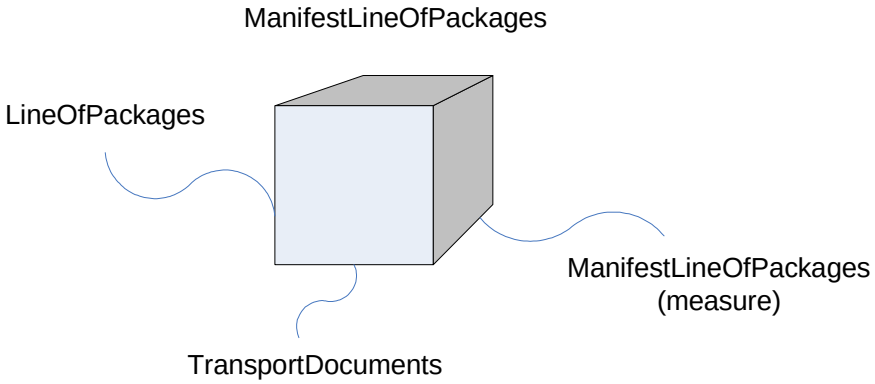
- The cube must contain the TransportDocument dimension for a unique identification of the Transport Document in which the Line of Packages is registered, typically this is named 'TD key ID' which is a combination of the two fields: 'Td prefix' and 'Td bill code' located on the Transport Document.Measure – Dimension with members

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

reflecting the aspects that have been 'measured' (reported). Every cube will have a measure dimension.

Considering the above, our Line of Packages cube would require the following dimensions:

- LineOfPackages – for members reflecting the applicable registration number(s)
- TransportDocuments – for members reflecting the applicable transport documents(s)
- ManifestLineOfPackages – measure dimension with the members: 'Declared gross wgt' and 'Commodity code'.



Note the difference between LineOfpackages/TransportDocuments on one hand and ManifestLineOfPackages on the other hand. For LineOfpackages/TransportDocuments we do not explicitly state the members that will be represented, like we do for the measure dimension ManifestLineOfPackages (Declared gross weight, Commodity code). The reason is that at the time the LineOfPackages and TransportDocuments are defined, we do not know what line of packages and what transport documents apply to the declaration that is going to be analysed.

We do know however that the members on the dimension LineOfPackages may be different for each declaration (each declaration has different number of Line of Packages) and that members on the dimension TransportDocuments will be different (each transport document has unique numbers). The members on the dimension ManifestLineOfPackages, however, are the same for each declaration. They all report 'Declaraed gross weight' and 'Commodity code'.

The dimensions LineOfPackages and TransportDocuments are said to be *dynamic dimensions*. The measure dimension ManifestLineOfPackages is said to be a *static dimension*.

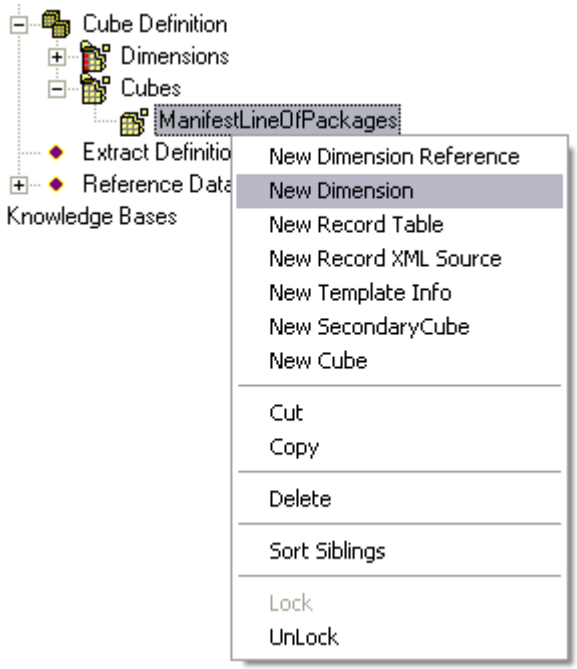
Dimensions can be inserted by making the cube in question the current element and selecting the [New Dimension] or [New DimensionRef] option from the context menu.

Select [New DimensionRef] if the dimension is a dimension listed under the [Dimensions] element (see illustration below). This allows cubes to share common dimensions (most typically, accounts and period dimensions are shared).

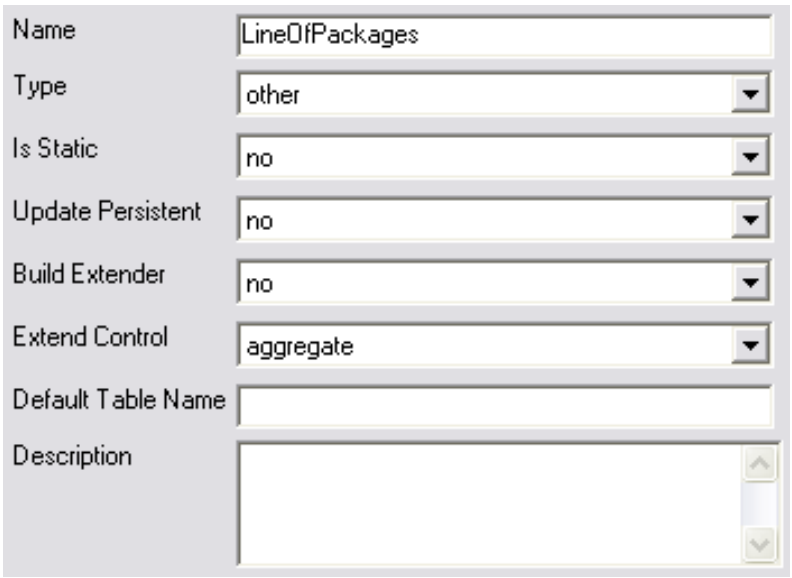
Note: Dimensions that are shared by more than one cube should be defined under the Dimensions element.

By selecting [New Dimension] we can define the entire dimension under the cube where it is being inserted.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



A [Dimension] element has the following attributes:



- Name

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

The [Name] attribute is used to specify a unique name. The [Name] attribute should be clear and concise (preferable relatively short), unique, and can not contain spaces.

- Type

  The [Type] attribute is used to indicate the type of the dimension in question. There are three types:

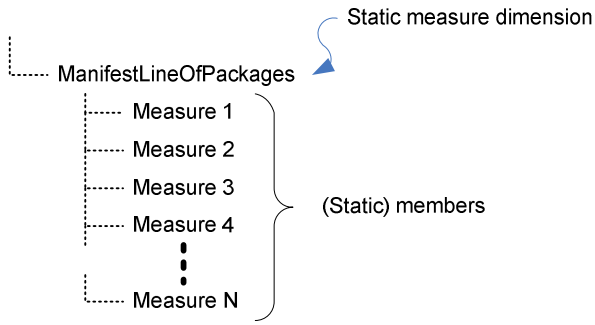
  - Measure – all measure dimensions must receive this type.
  - Period – all dimensions on which the members reflect a period must receive this type.
  - Other – all other dimensions (including LineOfPackages) must receive this type.

- Update Persistent
  The Update Persistent is not used in ESKORT Clearance Systems.

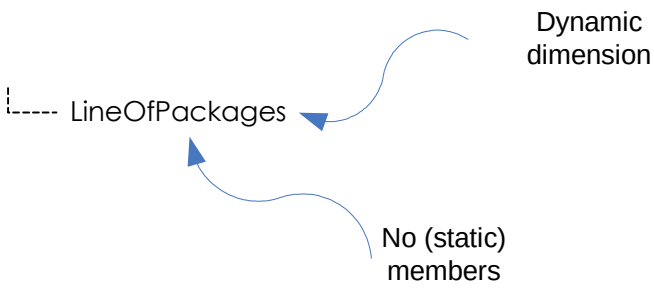
- Is Static

  The Is Static attribute is used to indicate whether the dimension has static members, which are defined in the environment (which is typical for the measure dimensions), or whether the members are created dynamically from the extracted data (which is typical for period dimensions as well as the LineOfPackages dimension).

  A dimension can be static if the members on the dimension are the same for all declarations. This is the case for the measure dimension, which has members that reflect 'what has been reported'. See below for an illustration of a static measure dimension:



  Dimension where the members depend on the declaration's data should in principle be made dynamic. This is for example the case for the LineOfPackages dimension, whose members reflect the (unique) registration numbers of a Line of Packages.



- Build Extender

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

This indicates whether or not a special 'extend member' is added to the dimension in question when the dimension is created. The Build Extender option is not often used in Selection Systems and rarely used in ESKORT Clearance Risk Analysis Systems, for that reason the Build Extender value is often set to **'no'**.

An extend member is typically needed when using members of one type of period dimension to access members of another type of period dimension, i.e. using a calendar year dimension member to access a fiscal year dimension member. In this context not all the calendar year members may be represented in the fiscal year dimension.

Currently, extension is only supported for dimensions of type 'period'.

To illustrate, consider an example from the tax domain using the following two cubes. The cubes should also contain an Account dimension; however for simplicity we omit this:

VAT_Monthly

	01-99	02-99	03-99	04-99	05-99	06-99	07-99	08-99	09-99	10-99	11-99	12-99
Sales	100	110	130	140	200	125	90	110	175	200	150	130
Purchases	40	45	50	60	45	70	40	50	60	40	20	50

VAT_Annual

	1998	1999	2000
Sales	1400	1660	1700
Purchases	500	570	600

The rule language allows conditions like the following:

VAT_Annual:Sales = VAT_Monthly:Sales

Assuming the rule in question evaluates individual years from the period dimension of the VAT_Annual cube and currently evaluates '1999', the condition would be equivalent to:

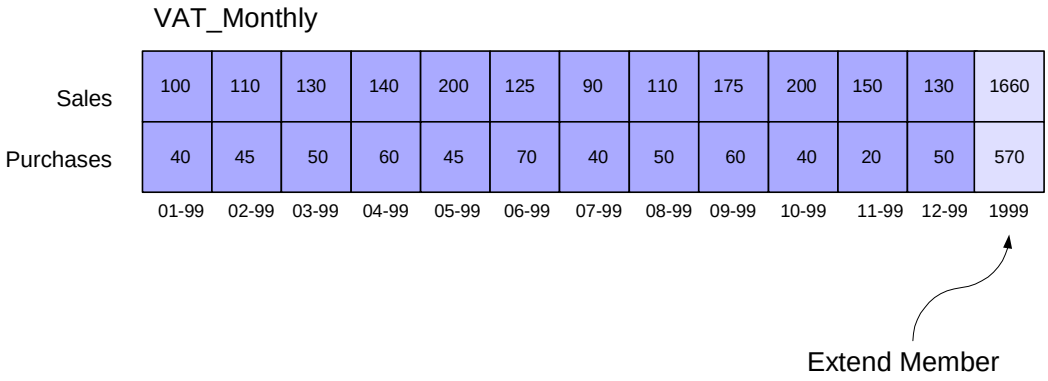
{'1999','VAT_Annual:Sales'} = {'1999','VAT_Monthly:Sales'}

Since the cubes VAT_Monthly and VAT_Annual have different period dimensions (monthly and annually), the system keeps processing the condition.

{'1999','VAT_Annual:Sales'} = {ExtendMember('1999'),'VAT_Monthly:Sales'}

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Upon evaluating the condition and accessing the VAT_Monthly cube, the system will execute a calculation to determine the value for the extend member in VAT_Monthly that corresponds to the period member from VAT_annual, which is 1999. See illustration below:



To look at our condition again, it would effectively evaluate to:

{'1999','VAT_Annual:Sales'} = SUM({'01-1999', 'VAT_Monthly:Sales'} , {'02-1999', 'VAT_Monthly:Sales'} , {'03-1999', 'VAT_Monthly:Sales'} ,… , {'12-1999', 'VAT_Monthly:Sales'})

In the example above all the monthly values are aggregated into the annual value, because they all overlap with the year in question.

In fact, what type of calculation should take place can be controlled through the [ExtendControl] attribute for [Dimension] and [Member] elements (typically measure dimensions and members).

The main reason for this is that different members on the measure dimension require different algorithms. For example, whereas aggregation works for 'Sales' in a VAT cube, it will not work for a 'status measures' like 'industry code' or 'number of employees' (at different points in time).

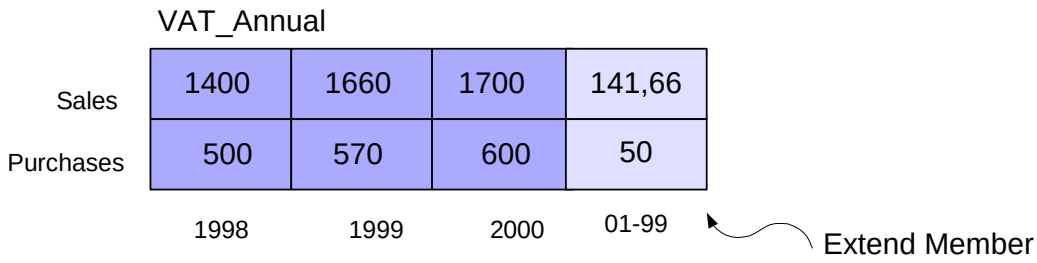
To give another example, consider the same comparison:

VAT_Annual:Sales = VAT_Monthly:Sales

However, this time we assume the rule evaluates the individual months from the period dimension of the VAT_Monthly cube.

The system will now calculate the extend member on the period dimension of the VAT_Annual cube.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



Upon evaluating the ’01-1999’ member, the system will calculate the extend member to find a value that corresponds to the month being evaluated.

The condition would effectively evaluate to:

{’01-1999’,’VAT_Annual:Sales’} = {’01-1999’,’VAT_Monthly:Sales’}

Since the VAT_Annual cube has a different period dimension (and ’01-1999’ is not represented on its period dimension), the condition evaluates to:

{ExtendMember(’01-1999’),’VAT_Annual:Sales’} = {’01-1999’, ’VAT_Monthly:Sales’}

The system will now calculate the extend member. The condition would effectively evaluate to:

*({‘1999’,’VAT_Annual:Sales’}/365) * 31 = {’01-1999’, ’VAT_Monthly:Sales’}*

The above implies that the Sales value from the VAT_Annual cube is based on the extend of the overlap between ’01-1999’ and ‘1999’.

- Extend Control

  Used to indicate the type of calculation to be used when a (period) dimension needs to be extended with an 'extend member' (see Build Extender for further explanation).

  The Extend Control option is not often used in Selection Systems and is not used in the standard ESKORT Clearance Risk Analysis Systems, for that reason the ExtendControl value is often set to ‘**no_control’**.

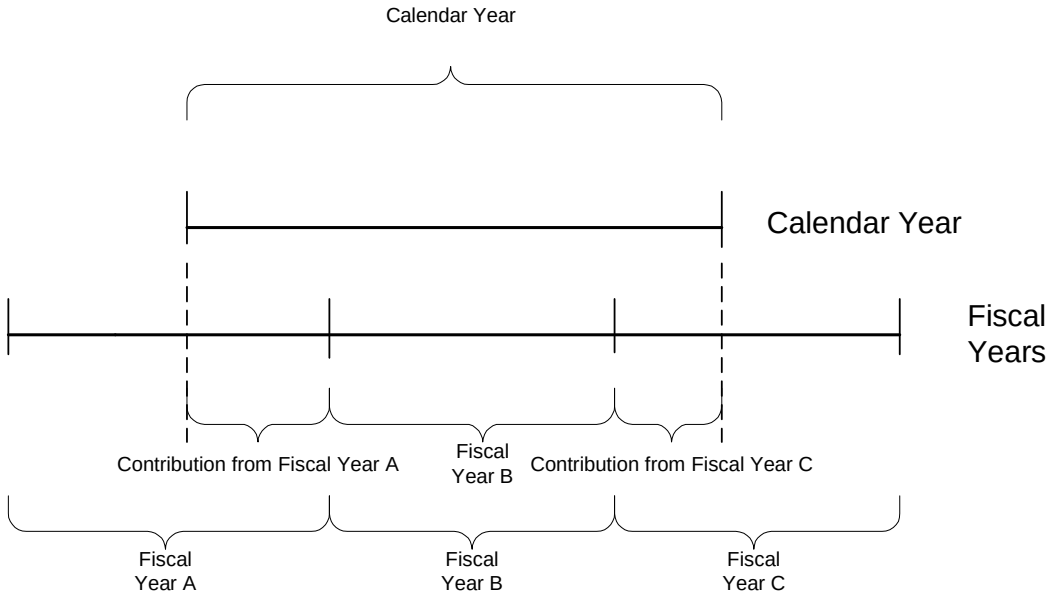
  This is an attribute for both dimensions and members. For dimensions the attribute indicates a default value to be used by the dimension’s members. For members the attribute can be used to override the default setting on the dimension.

  Note that only one member in a coordinate is allowed to have the [Extend Control] attribute set. As a rule of thumb, only set the [Extend Control] attribute for measure dimensions and members.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Use '**no_control**' to indicate that the dimension in question does not control the extension. Using **'no_control'** for members causes the member to use the default setting for the dimension.

'**aggregate**' indicates aggregation of contributions of source periods overlapping with the destination period. For example, if conversion is necessary from a fiscal year to the calendar year it partly overlaps then the considered fiscal year and possibly several other fiscal years, would contribute to a value applicable to the calendar year. See below:



In the example above, if the destination period is the calendar year, then there are three fiscal years that (partly) overlap this destination period (source periods). Conversion would take contributions from all three fiscal years to calculate a value applicable to the calendar year.

Let us assume that the calendar year is 1999 and that the three fiscal years are:

- Fiscal Year A: '19981101-19990331' (value: 1000)
- Fiscal Year B: '19990401-19991030' (value: 1200)
- Fiscal Year C: '19991101-20000331' (value: 1300)

The system then calculates the number of days these fiscal years overlap the destination period (1999), which would be: 90, 214 and 61. After this, the system will divide each cell value with the total number of days in the period and multiply that with the overlapping days. Doing so, the final value for the extended member will be:

*((1000/151*90)+(1200/214*214)+(1300/151*61) = 2321.19.*

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

'**interpolate**' implies that the value will be determined by interpolation of the latest source period that ends before the end date of the destination period and the first source period that ends after the end date of the destination period.

In our example the destination period ends at '19991231' (end of December 1999) so the two members to interpolate between are Fiscal Year B and Fiscal Year C ('19990401-19991030' and '19991101-20000331'). The slope for the interpolation is: ('value for latest source period' minus 'value for first source period') divided by 'number of days between the end dates of the two source periods'. In our example this would be:

(Fiscal Year C – Fiscal Year B) / 151 = (1300-1200)/151 = 0.66.

The value for the extended cell will be: The interpolation slope multiplied by number of days from the end date of the first source period up to the end date of the destination period plus the value for the first source period. So the final value for the extended cell in our example will be:

*0.66*61+1200 = 1240.26*

Note the big difference between aggregation and interpolation. In general, interpolation is not suitable for transactional measures. If we however assume that the values provided in the example reflect the number of employees in different fiscal periods, then interpolation would make more sense. In this case the number of employees for the year ending December 1999 would be an interpolation between 1200 and 1300 (which are the number of employees for Fiscal Year B and Fiscal Year C).

'**mean**' indicates determination of the estimated value as the mean of values of the source periods.

In our example the extended value would be:

(1000+1200+1300)/3 = 1166.67

'**first**' indicates that the value will be the value from the first source period overlapping with the destination period.

In our example the extended value would be: 1000.

'**last**' indicates that the value will be the value from the last source period overlapping with the destination period.

In our example the extended value would be: 1300.

'**smallest**' indicates that the value will be the smallest value from the source periods overlapping with the destination period.

In our example the extended value would be: 1000.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

'**largest**' indicates that the value will be the largest value from the source periods overlapping with the destination period.

In our example the extended value would be: 1300.

'**set**' implies operating with a value for the measure, which is the set of values from source periods overlapping with the destination period. Note that this conversion requires the use of different operations on the converted measure (i.e. testing whether a value is in the resulting set, rather than for equality).

In our example the set would be:

{1000,1200,1300}

This type of extension gives more sense for a status- or type- kind of measures that could change throughout the period dimension. If, for instance, a measure 'CalcType' for the requested period has four different values: 'A', 'B', 'C' and 'D', then the value for the extended cell will be: {A,B,C,D}. When using such a value in an operation, the system will use set operations instead of simple operations.

The following examples will illustrate this:

{A,B,C,D} = {A} will evaluate to true because {A} is within {A,B,C,D}.

{A,B,C,D} < {A} will evaluate to false because non of the elements in {A,B,C,D} is less than {A}.

{A,B,C,D} > {A} will evaluate to true because 'B' in {A,B,C,D} is greater than {A}.

{A,B,C,D} - {A} will evaluate to {B,C,D}.

{A,B,C,D} + {A} will evaluate to {A,B,C,D}.

{A,B,C,D} + {E} will evaluate to {A,B,C,D,E}.

'*' and '/' cannot be evaluated on sets (operation results in a NULL value).

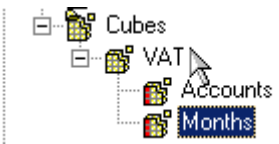
- Default Table Name

  Can be left blank.

2.4.3.3 Creating Period Dimensions

Cubes that contain periodic data are typically used within Selection systems and have typically a dimension of the type ‘period’.

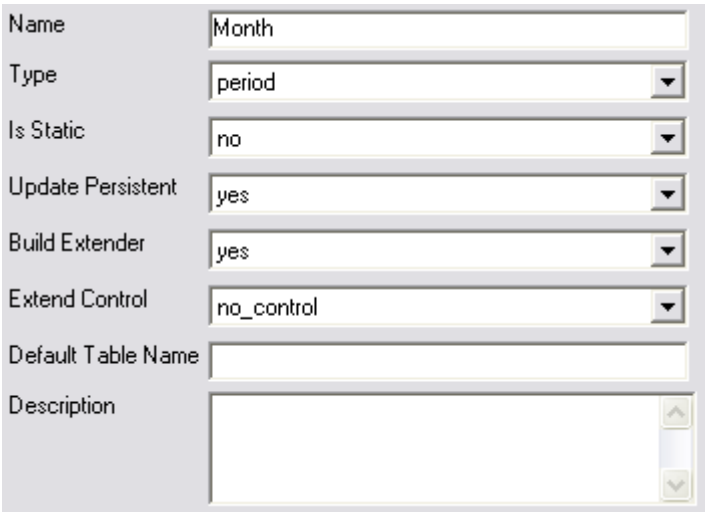
This is the case for aVAT cube (which has a period dimension with members reflecting months).



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

In the editor pane we set the attributes as follows:

- Type – 'period' indicates this dimension is a period dimension

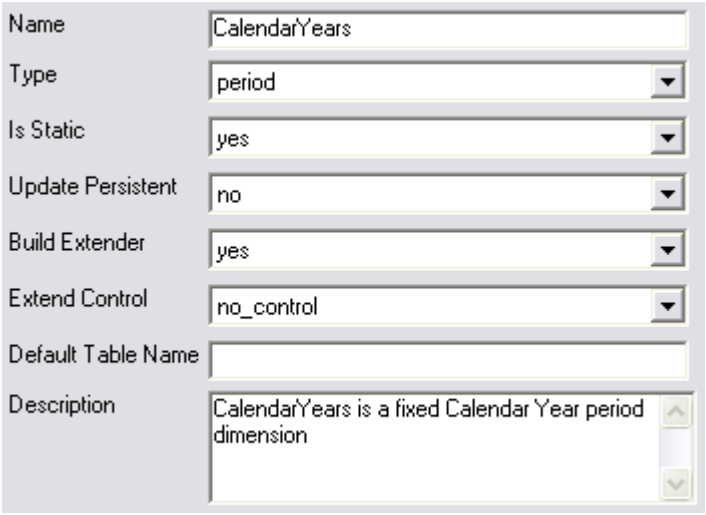


2.4.3.4 Static Period Dimensions

In general, period dimensions are dynamic. However, period dimensions can also be made static (with static members) if the members reflect periods that all taxpayers have in common, which is typically the case for returns that cover an entire calendar year.

In that case, the cube would need a period dimension (CalendarYears), with members that reflect calendar years.

See below:



The attribute settings are the same as the settings for our Months dimension, except for the [Is Static] attribute, which is set to 'yes' (implying that this is a static dimension).

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

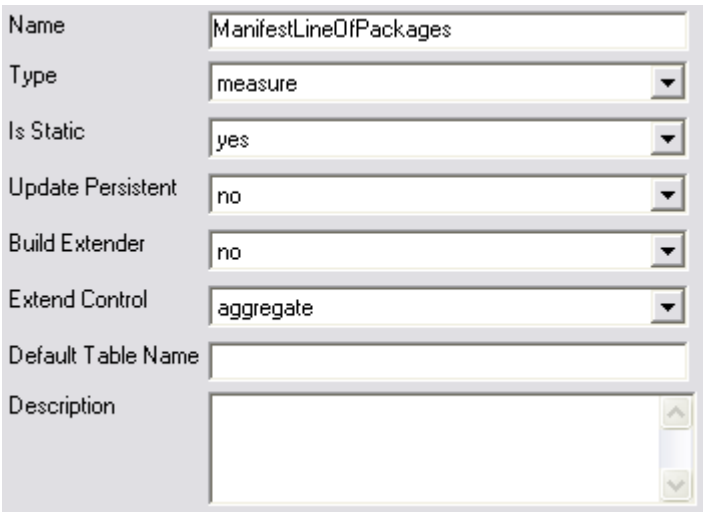
2.4.3.5 Creating Members

As explained above, static dimensions have static members, which must be defined in the environment.

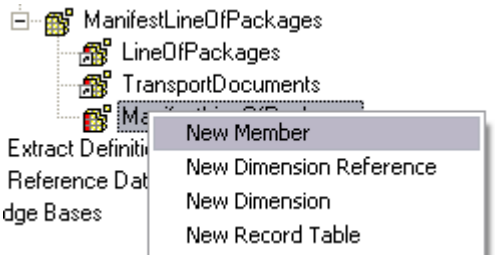
Using our new ManifestLineOfPackages cube as an example, we both added the dimensions LineOfPackages and TransportDocuments. We will now first add the measure dimension ManifestLineOfPackages.

Note: The name of the measure dimension should be the same as the name of the cube.

The attributes in the editor pane are as follows:



- Type – ‘measure’, since this is the measure dimension of our ManifestLineOfPackages cube
- Is Static – ‘yes’, since this dimension is static.
- Build Extender – ‘no’, since this is only supported for period dimensions.
- Extend Control – ‘aggregate’.

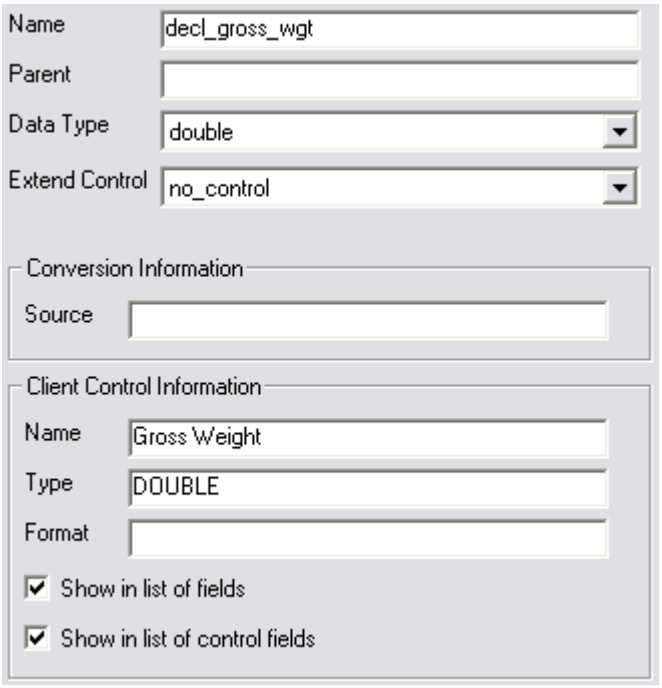


Members can be added by making the dimension in question the current element and then selecting [New Member] from the context menu.

A new member will be inserted in the dimension.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

[Member] elements have the following attributes:



- Name – name of the member (no spaces allowed)
- Parent – this attribute is not currently used, and can be ignored by the user.
- Data Type – used to specify the data type of the member.

  The following types are possible:

  - Unknown – data type unknown

    Note that members in the measure dimension may not have the [Type] attribute set to 'Unknown', since the members in the measure dimension identify what was measured or reported. This could be a name (e.g. "Acme Incorporated"), an integer number (e.g. 5), a real number (e.g 25.124), or an amount (e.g. 233013.50).

  - Double – numeric (size double)

    Use this when data is real number (e.g. 25.124), or an amount (e.g. 233013.50), i.e. when the data is a number with decimals.

  - Long – numeric (size long)

    Use this when data is an integer number (e.g. 5), i.e. when the data is a number without decimals.

  - String – text

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Note that there for example is no 'Date' data type (as well as other common data types). The reason for this is that the data types shown here are the possible data types for members (and not fields in the database – which would typically allow more data types). The data types 'double' and 'long' are typically used for all numerical database fields. All other fields would use either 'unknown' or 'string'.

- Extend Control – see Extend Control under 2.4.3.2.
- Name (Client Control Information)
  The name of the field used in ESKORT Clearance Workbench. In case you would like to change the name of the field in ESKORT Clearance Workbench it is done here.
- Type (Client Control Information)
  The value type that can be contained in the field in ESKORT Clearance Workbench. The type that is specified here defines what kind of data that the ESKORT Clearance Workbench user can enter into the field. The following types applies:
  - STRING – A free text
  - DOUBLE – A floating point value (real number).
  - LONG – An integer value (positive or negative)
- Format (Client Control Information)
  This field is not currently used.
- Show in list of fields (Client Control Information)
  If checked the field can be used in the Partial Expression Viewer of the ESKORT Clearance Workbench.
- Show in list of control fields (Client Control Information)
  If checked the field can be used as a report back field in the ESKORT Clearance Workbench.

After entering the attributes, the tree structure looks as follows:

And after adding Commodity:

This effectively completes the definition of the cube. We have created the cube as well as the three dimensions it is spanned by. For the measure dimension (ManifestLineOfPackages), we added the two members 'Declared gross weight' and 'Commodity code'.

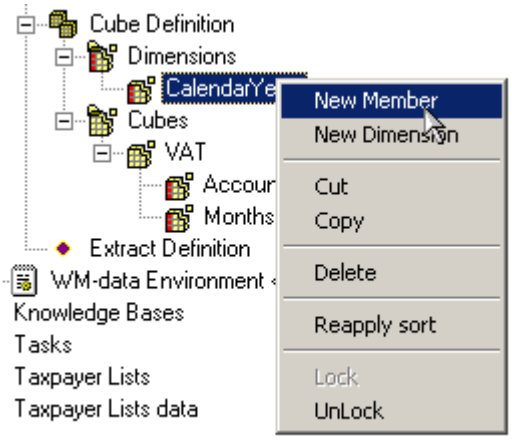
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.4.3.6 Adding Members to a Static Period Dimension

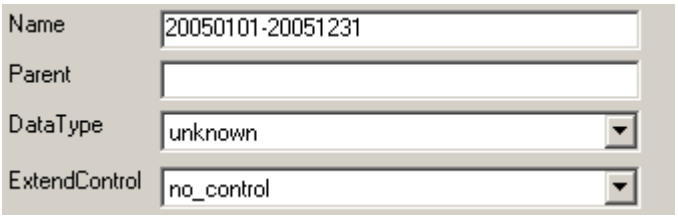
Static Period Dimensions are rarely used in ESKORT Clearance Risk Analysis Systems; however they can be used when extracting data from external data sources. For that reason the Static Period Dimension is described in this section.

The example used in this section takes offset in a VAT cube having a dynamic Accounts- and Month-dimension.

Adding members to a static period dimension can be done by making the dimension in question the current element and then selecting [New Member] from the context menu.

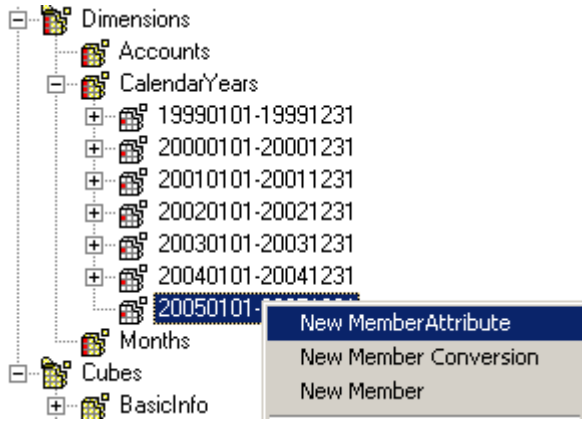


The illustration below shows a member intended to cover 2005:

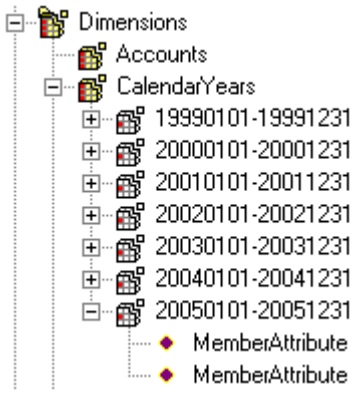


Note that the recommended naming convention for static period members is to use the fully qualified period, i.e. 2005 is specified as 20050101-20051231.

In addition to the member itself two special ‘member attributes’ must be inserted. You can do this by making the member in question the current element and selecting [New Member Attribute] in the context menu.

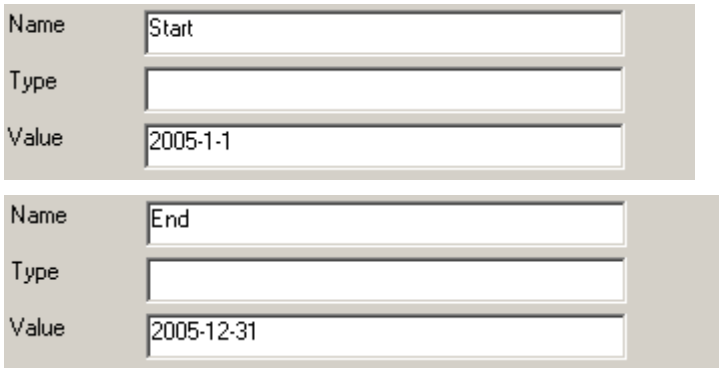


Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



The purpose of these two member attributes is to define the exact start date and end date of the period in question.

The following illustrations show the editor panes for the two member attributes:



- Name – name of the attribute

  The name of the first member attribute should be ‘Start’ and the name of the second ‘End’.

- Type – data type. This attribute can be left empty.

- Value – value of the attribute.

  The first member attribute should contain the start date of the period in the format shown above.

  The second member attribute should contain the end date of the period in the format shown above.

In the same fashion more members (covering other calendar years) may be added.

½

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

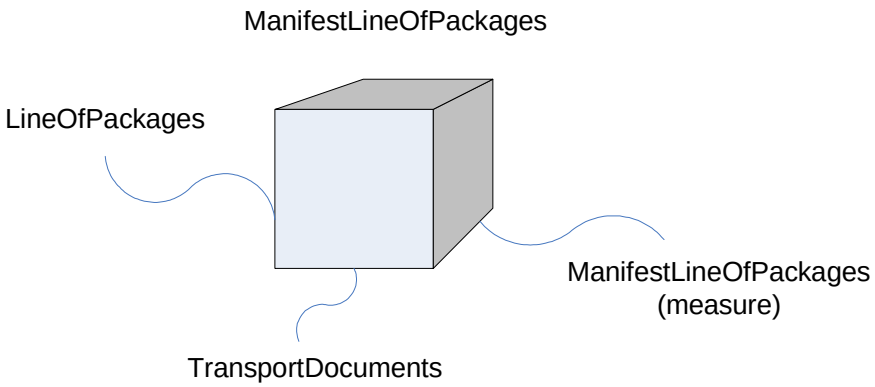
2.5 Extract Definition

2.5.1 Introduction

In general, the extract definition defines what the data sources are and how data should be extracted and loaded into the cubes.

To illustrate the aspects that need to be addressed, consider our ManifestLineOfPackagescube, which is spanned by the following dimensions:

- LineOfPackages – Line of Packages dimension
- TransportDocuments – Transport Documents dimension
- ManifestLineOfPackages – measure dimension



Assume that we have a declaration contained in the following XML-document:

```
<message>
  <data>
    <sd>
      <sd_reg_no>1234567890ABCDEFG</sd_reg_no>
      <td>
        <td_prefix>AVX</td_prefix>
        <td_bill_code>12345678</td_bill_code>
        <lp>
          <lp_no>1</lp_no>
          <decl_gross_wgt>100.0</decl_gross_wgt>
          <commodity>50071000</commodity>
        </lp>
        <lp>
          <lp_no>2</lp_no>
          <decl_gross_wgt>20.0</decl_gross_wgt>
          <commodity>93051000</commodity>
        </lp>
        <lp>
          <lp_no>3</lp_no>
          <decl_gross_wgt>25.0</decl_gross_wgt>
          <commodity>11051000</commodity>
        </lp>
      </td>
      <td>
        <td_prefix>SAS</td_prefix>
        <td_bill_code>76235199</td_bill_code>
        <lp>
          <lp_no>1</lp_no>
          <decl_gross_wgt>500.0</decl_gross_wgt>
          <commodity>11051000</commodity>
        </lp>
        <lp>
```


Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

```
          <lp_no>2</lp_no>
          <decl_gross_wgt>550.0</decl_gross_wgt>
          <commodity>22021000</commodity>
        </lp>
        <lp>
          <lp_no>3</lp_no>
          <decl_gross_wgt>130.0</decl_gross_wgt>
          <commodity>50071000</commodity>
        </lp>
      </td>
      <td>
        <td_prefix>KLM</td_prefix>
        <td_bill_code>13391727</td_bill_code>
        <lp>
          <lp_no>1</lp_no>
          <decl_gross_wgt>110.0</decl_gross_wgt>
          <commodity>93051000</commodity>
        </lp>
        <lp>
          <lp_no>2</lp_no>
          <decl_gross_wgt>18.0</decl_gross_wgt>
          <commodity>11051000</commodity>
        </lp>
        <lp>
          <lp_no>3</lp_no>
          <decl_gross_wgt>540.0</decl_gross_wgt>
          <commodity>22021000</commodity>
        </lp>
      </td>
    </sd>
  </data>
</message>
```

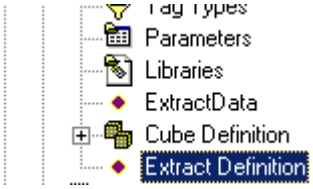
The following aspects need to be addressed:

- **Identification of unique identifiers** - how to identify the unique identifiers belonging to Transport Documents and Line of Packages?
- **Location of measure data** – where in the XML-structure the gross weight and commodity codes are located?

The identification of unique keys and the location of the measure data are done by defining RecordXML source - see next section.

2.5.2 RecordXML Source (mapping of XML-elements into cubes)

The [Extract Definition] element in the environment is a placeholder for all definitions of how data is loaded from the data sources (i.e. XML-structures and database tables) into the cubes.

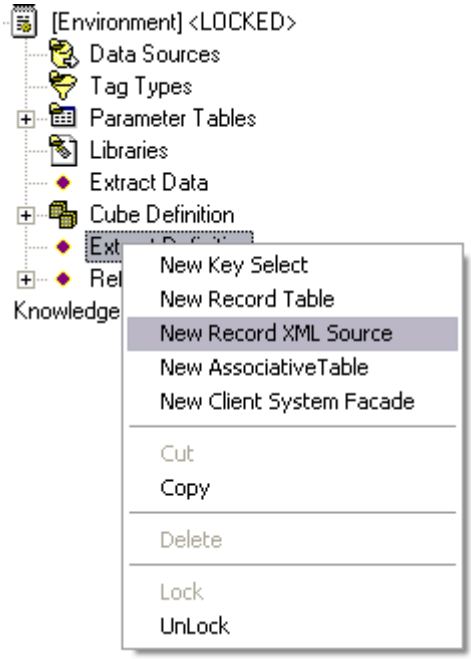


Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

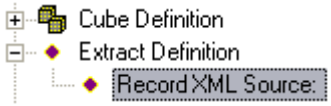
The [Extract Definition] element in the environment has an attribute called [Provide Key]. The [Provide Key]-attribute is used only when accessing data from a database and is rarely used in Clearance systems; however section 2.5.4 describes to use of the attribute.

The [Extract Definition] element can contain several [RecordXML Source]-elements. A [RecordXML Source]-element defines a sub-structure in the XML-structure containing the declaration data by defining what is called an XPath and by defining how the various elements in the sub-structure is mapped into the cubes.

You can create a new [RecordXML Source]-element by selecting [New Record XML Source] from the context menu.

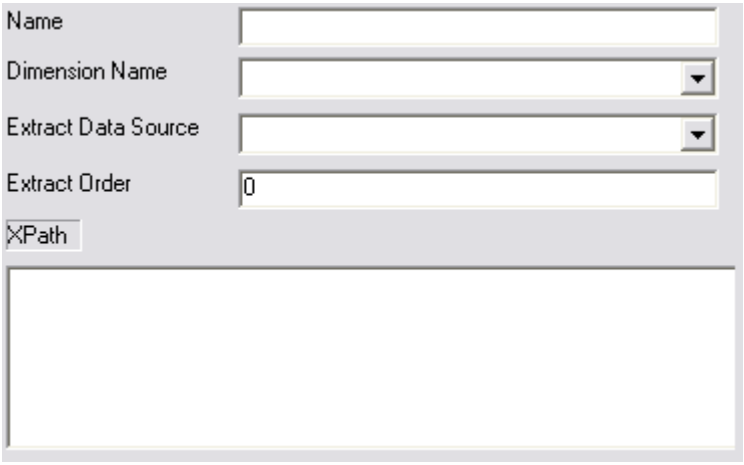


This will insert a new [RecordXML Source]-element.



The editor pane shows the following attributes:

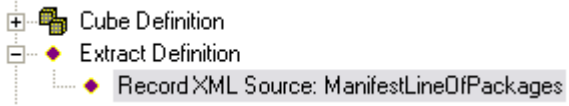
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



- Name – The name of the RecordXML Source
- Dimension Name – The default dimension into which the values will be mapped unless other is specified in the child elements.
- Extract Data Source – The data source from which the data is being extracted.
- Extract Order – The priority order by which the data is extracted compared to other RecordXML Sources.
- XPath – The path to the root-element in the sub-structure.

The text entered into the [Name]-attribute is used to identify the RecordXML Source in fact the entered text will be shown in the structure pane on the [RecordXML Source]-element.

Enter the name: “ManifestLineOfPackages” as the name of the [RecordXML Source]-element and click the [Tab]-button. Hereby the focus is changed to the next attribute and the content in the structure pane is updated.



The [Dimension Name]-attribute selects the dimension into which the data is mapped. Because we are configuring the ManifestLineOfPackages-dimension we select that.

The [Extract Data Source]-attribute selects the data source from which the data is extracted. In the Clearance systems the data is read as XML provided real-time. The provided data is accessible through the “CurrentDeclaration”-data source.

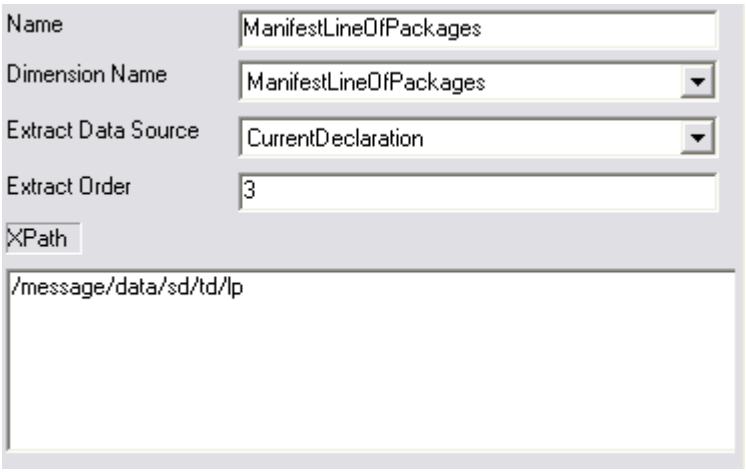
In case several RecordXML Sources are providing data to the same members in a dimension the last executed RecordXML Source will overwrite data already read by the RecordXML Sources previously executed. The order by which the RecordXML Sources are executed can be controlled by prioritizing by entering a number into the [Extract Order]-attribute.

The [XPath]-attribute denotes a path from the XML-document root down to the element below which the data for the dimension is located. The syntax of the XPath is a list of all element-tags passed from the root down to the element. The tags are separated by a slash (/). By starting the XPath by a slash we indicate that we start from root of the XML-document.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Because the root node of our XML-document is “message” we start the XPath with: “/message” hereafter we navigate down to the element below which the elements for the dimension is located by adding each passed element-tag to the XPath separated by a slash.

Hereby we get the XPath: “/message/data/sd/td/lp”.



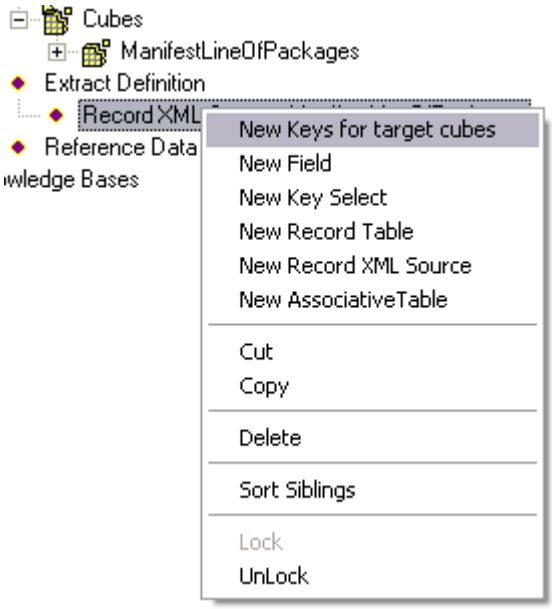
2.5.2.1 Keys for target cube (Mapping fields to dynamic dimensions)

In previous section we defined a RecordXML Source which defined one source for the data for one dimension. This section describes how the key data is mapped into the cubes. The ManifestLineOfPackages-cube contains two dynamic dimensions (TransportDocuments and LineOfPackages) and one static, measure dimension. The dynamic dimensions require unique values, e.g. each Transport Document number must be uniquely identified. Let us have a look at the dynamic dimensions in the ManifestLineOfPackages-cube and specify the keys for them.

[Keys for target cube]-elements are also used when accessing tables in a database; however this section concentrates on the XML-document. For more information about how to use [Keys for target cube]-elements in context of database extraction please refer to section 2.5.7.

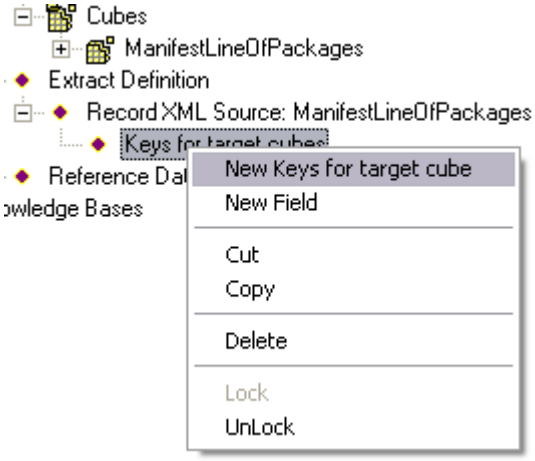
You can create a new [Keys for target cube]-element by selecting [New Keys for target cube] from the context menu.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



This will insert a new [Keys for target cubes]-element into the defined RecordXML Source-element.

The editor pane shows no attributes. This is because the [Keys for target cubes]-element is a placeholder for sub-elements each defining keys for a specific cube. You can create keys for a specific target cube from the context menu.



This will insert a new [Keys for target cube]-element.

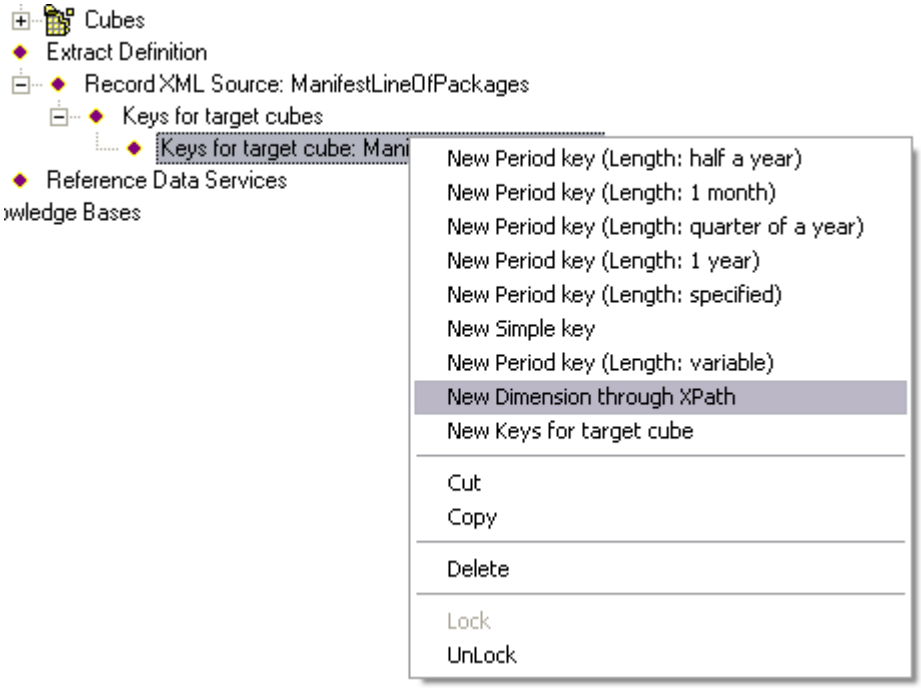
The editor pane shows the following attributes:

- Cube name – The target cube for which the keys are defined

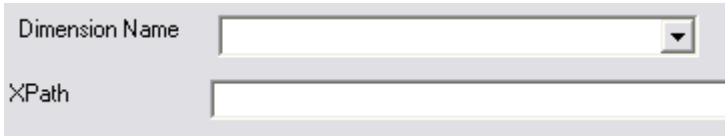
We are working with the ManifestLineOfPackages-cube, so we select that one. In case the RecordXML Source should be used to read data into several cubes there should be created one [Keys for target cube]-element for each cube.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Now we have to define the elements in the XML-document, which values are used for the keys. First we define it for the LineOfPackages-dimension. To do so select the [New Dimension through XPath] from the context menu.



This will insert a new [Dimension: . XPath]-element into the [Keys for target cube]-element. The editor pane shows the following attributes:



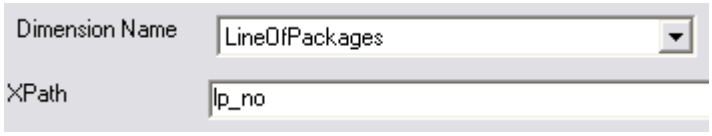
Dimension Name – The dimension into which the key value is mapped.

- XPath – The path to the element on the XML-document that is mapped.

A [Dimension: . XPath]-element maps specific XML-elements into a specific dimension. The dimension is selected in the [Dimension Name]-attribute. When that is done the name of the [Dimension: . XPath]-element is renamed to [Dimension: **NAME**. XPath]-element, where **NAME** is the name of the selected dimension.

In the [Dimension Name]-attribute select LineOfPackages. Go to the [XPath]-attribute (notice that the [Dimension: . XPath]-element now changes name to: [Dimension: LineOfPackages. XPath]).

The value on the XML-document used to identify the Lines of Packages is the lp_no-element. In the [XPath]-attribute this should be denoted as an XPath relative to the XPath specified for the RecordXML Source. Because the lp_no-element is located just below the lp-element we only need to specify “lp_no”.



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Because the XPath for the RecordXML Source was “/message/data/sd/td/lp” the complete XPath to the lp_no-element is: “/message/data/sd/td/lp/lp_no”.

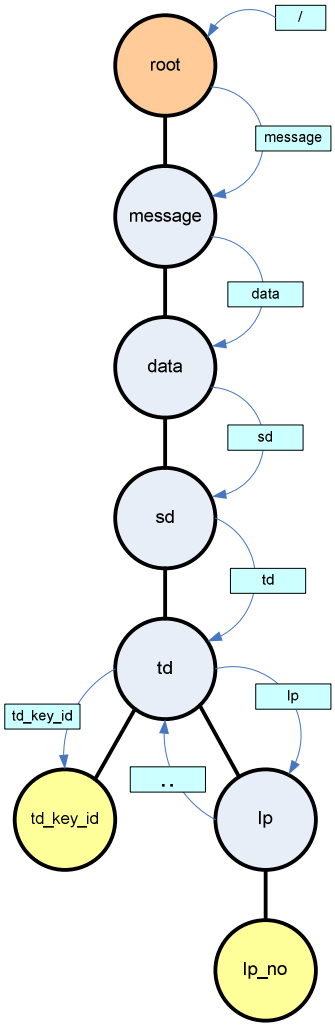
The [Dimension: LineOfPackages. XPath] now creates a value on the LineOfPackages-dimension for each value in the XML-document found on the location: “/message/data/sd/td/lp/lp_no”.

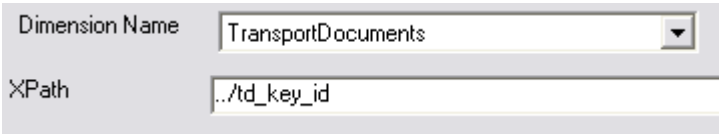
For the TransportDocument-dimension a [Dimension: TransportDocument. XPath]-element must also be defined. Because the primary key of a transport document in the XML-document is a combination of two fields, the XML-document is pre-processed (See Client System Facade) by which a new element is created and inserted below the td-element. The new element is named td_key_id and is a concatenation of the td_key_id- and the td_bill_code-elements.

For the [Dimension: TransportDocument. XPath]-element the [Dimension Name]-attribute is TransportDocuments and the XPath is “../td_key_id”. Notice the double periods (..) – the notation indicates the parent level of the previous defined XPath. By this the XPath for the td_key_id-element becomes: “/message/data/sd/td/lp/../td_key_id”.

The figure below illustrates how the complete XPath is interpreted. The interpretation starts with the slash (/) pointing out the root-element (the top-most). Hereafter each element is specified by name. When the double periods (..) is met the interpreter takes one step back.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence





2.5.3 Field (Defining measures for the static dimension)

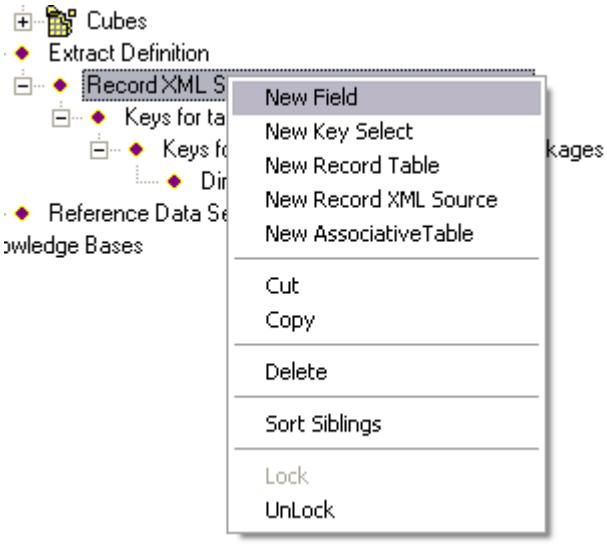
In previous section we defined how data is extracted from the XML-document into the dynamic dimensions. This section describes how the data is mapped into the static dimension – also denoted as the measure dimension.

In the RecordXML Source this is done by adding a [Field]-element for each measure. In the previous example we described that the measure dimension consists of the two fields: Commodity code and Gross weight – in the XML-document these are denoted by the XML-elements: commodity and decl_gross_wgt.

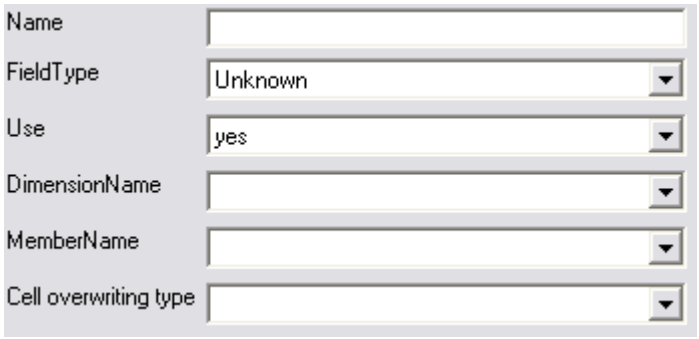
Let us begin by defining how the Commodity code is extracted.

You can create a new [Field]-element by selecting [New Field] from the context menu.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



This will insert a new [Field]-element into the [RecordXML Source]-element. The editor pane shows the following attributes:



- Name – The name of the XML-element containing the measure.
- FieldType – The type of data read from the XML-element.
- Use – Indicates whether the field is used.
- DimensionName – The dimension into which the value is extracted.
- MemberName – The name of the member in the dimension.
- Cell overwriting type – Indicates how situation should be managed if a value is already read into the cube-member.

Now let us enter values for the Commodity code. The name of the XML-element containing the Commodity code is “commodity”, hence we write that into the [Name]-attribute. Please note that after entering the name (and leaving the attribute) the name of the element in the structure pane is changed to that name.

When reading the values from XML the form at which they are represented is always text – for that reason we select the [FieldType]-attribute: Text.

We want to use the commodity code in our cubes, hence we leave the [Use]-attribute to *yes*.

We are extracting the values into the ManifestLineOfPackages-dimension. Because the default dimension defined by the RecordXML Source is also ManifestLineOfPackages we

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

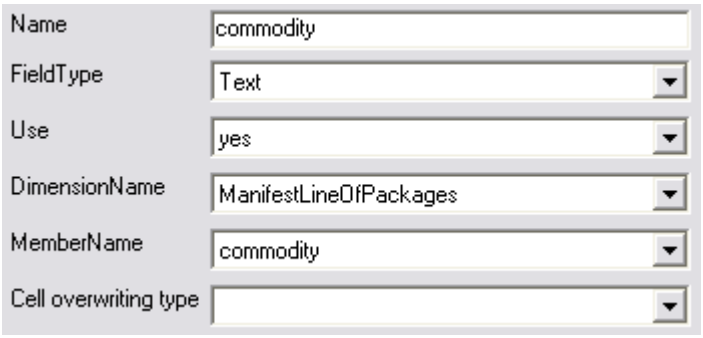
could leave it blank; however we could also specify it at this time – by doing so we ensure that the ManifestLineOfPackages-dimension will always be the target even though the default-dimension is changed.

The Commodity code should be extracted into the commodity-member on the measure dimension, hence we change the [MemberName]-attribute to be commodity.

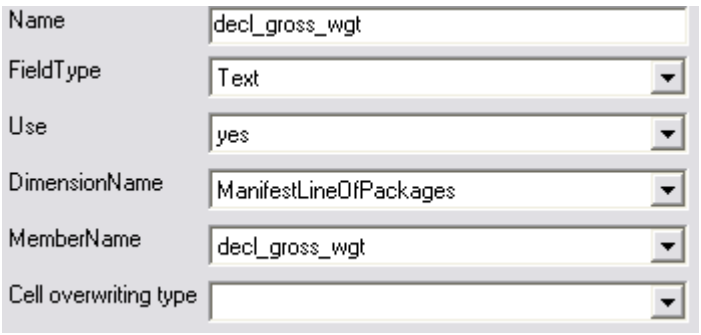
We are not doing any cell overwriting – so we leave it blank – i.e. the same as "Last". Other options are:

- Blank – Same as Last.
- Last – The last extracted value is used
- Set – The extracted value is added to a set containing the previously extracted values for this field.
- Sum – The extracted value is added to the previously extracted (and summed) values – hereby the final value becomes the sum of all extracted values for this field.

Hereby the attributes for the commodity field is as follows:



The Gross weight field is added in the same manner as the Commodity code. The attributes for the Gross weight field should be as follows:



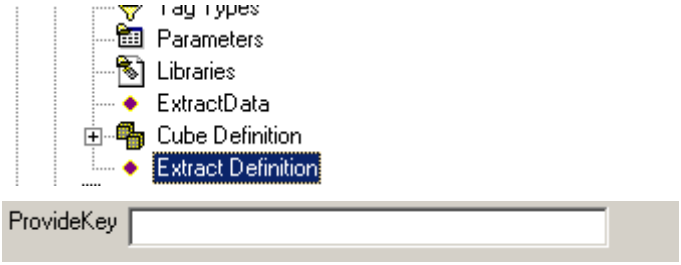
2.5.4 ProvideKey attribute (identification of registration numbers)

The [ProvideKey]-attribute is rarely used in ESKORT Clearance Risk Analysis Systems; however it can be used when extracting data from external data sources. For that reason it is described in this section.

The example used in this section takes offset in a VAT cube having a dynamic Accounts- and Month-dimension.

The [Extract Definition] element in the environment has an attribute called [ProvideKey].

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



This attribute should contain an SQL query that returns the (distinct) set of registration numbers for a single taxpayer. The query should have the following format:

> *SELECT <registration number field> FROM <table with registration numbers> WHERE <unique identifier field> = ?*

Upon extracting data for a taxpayer, the system will replace the parameter (question mark) in the query and subsequently fire it to obtain the set of registration numbers for the taxpayer in question.

The set of registration numbers will be needed to obtain all registration and periodic (returns) data. Note that if all taxes are remitted under a single number, then only that number is required to retrieve all information.

See the examples below:

> *SELECT CustomerNumber FROM MainRegistrationTable WHERE CustomerNumber = ?*

Note that the example above implies that the registration numbers are listed in the table 'MainRegistrationTable' and that taxpayers only have one number.

> *SELECT AccountNumber FROM AccountNumberSet WHERE MainAccountNumber = ?*

The query in the example shown above could in principle return multiple registration numbers ([AccountNumber] field) from the AccountNumberSet table.

To return to our example, we will assume there is a table called MainRegistrationTable which holds all registration numbers ([AccountNumber] field) under which taxes are being remitted (including, but not limited to VAT registration numbers). The numbers belonging to one taxpayer can be identified using the [MainTaxpayerIdentifier] field. The query is as follows:

> *SELECT AccountNumber FROM MainRegistrationTable WHERE MainTaxpayerIdentifier = ?*

2.5.5 KeySelect Element (identification of registration numbers)

The [KeySelect]-attribute is rarely used in ESKORT Clearance Risk Analysis Systems; however it can be used when extracting data from external data sources. For that reason it is described in this section.

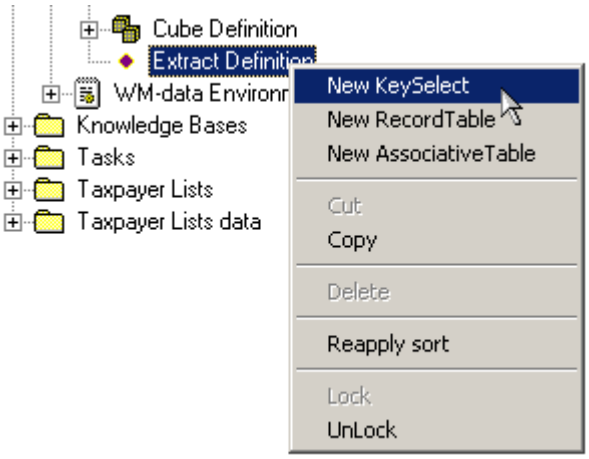
The example used in this section takes offset in a VAT cube having a dynamic Accounts- and Month-dimension.

In certain situations, registration numbers can not be obtained from a single source (data source, table).

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

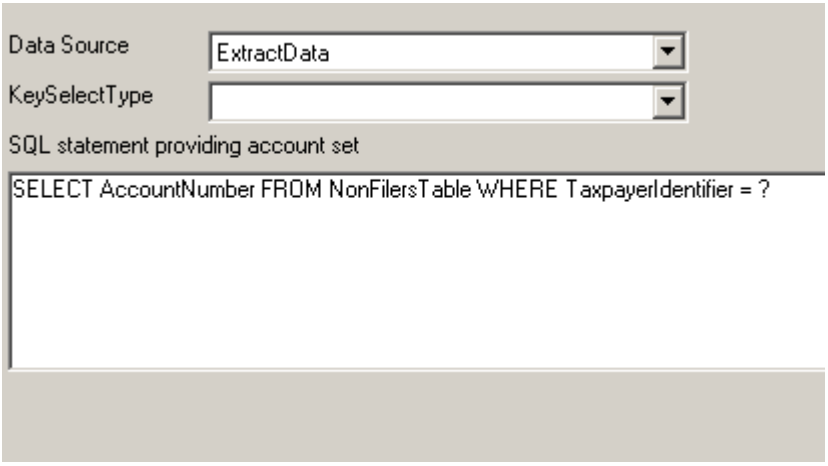
To illustrate, non-filers are not listed in the table MainRegistrationTable (see above), but may instead be listed in a separate table used to maintain lists of non-filers (with an alternative, maybe hypothetical, registration number).

For this purpose, so called [KeySelect] elements may be added. This can be done by making the [Extract Definition] element the current element and selecting [New KeySelect] from the context menu.



This will insert a new [KeySelect] element.

The editor pane shows the following attributes:



- Data Source – data source to use (see also 2.6)
- KeySelectType – can be left blank
- SQL statement providing account set – alternative SQL query returning set of registration numbers for a taxpayer.

The system always first fires the query provided in the [ProvideKey] attribute of the [Extract Definition] element. If this query does not return any registration numbers, then the system looks for [KeySelect] elements. If a [KeySelect] element exists, the system fires the

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

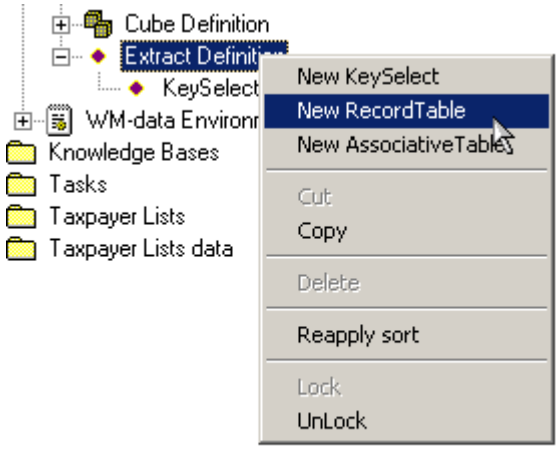
associated query. If this query does not return registration numbers either, the system continues to look for more [KeySelect] elements.

2.5.6 RecordTable Element (source of the data)

The [RecordTable]-element is rarely used in ESKORT Clearance Risk Analysis Systems; however it can be used when extracting data from external data sources. For that reason it is described in this section.

The example used in this section takes offset in a VAT cube having a dynamic Accounts- and Month-dimension.

To populate cubes, you need to create so-called [RecordTable] elements. They can be inserted by making the [Extract Definition] element the current element and selecting [New RecordTable] from the context menu.

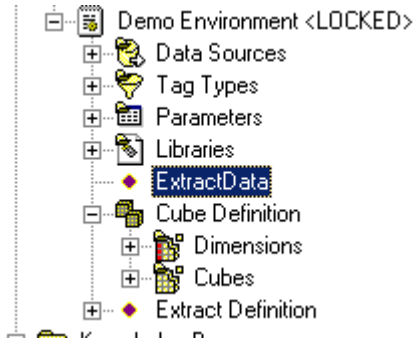


This will insert a new [RecordTable] element.

The RecordTable element has the following attributes:

- Name – name of the table the data should be extracted from.
- KeyCol – the name of the key column. This should be the field that contains the registration number.
- DimensionName – name of the (measure) dimension to map the fields to.
- ExtractDataSourceRef – data source where table can be found. If left blank, the system will use the default data source provided in the [DataSourceRef] attribute of the [ExtractData] element (child of [Environment] element).

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



- ExtractOrder – the order in which the system should process the various [RecordTable] elements. The elements are processed from low to high.

  The reason for processing some [RecordTable] elements before others is that some tables may be used for building the dynamic dimensions that are used by multiple cubes.

  To illustrate, imagine having two tables with periodic data (tax returns), remitted for the same fiscal years.

  Lets assume that the first table has the following information:

EndDate	Months	FieldA	…
20010630	12	100	…
20021231	18	150	…

  and the second table has the following information:

Period	FieldB	…
200106	52	…
200212	75	…

  As you can see, only the first of these tables contain details regarding the actual lengths of the fiscal periods involved. The other table does not contain this information although it does contain some (limited) information about the fiscal years in question (year and month).

  In this situation, the first table should be processed before the second table, and used to build the dynamic fiscal year dimension. The period information in the second table – though not sufficient to determine the fiscal periods – is sufficient to determine which fiscal period the data in a record relates to[1].

- Record Extraction SQL - explicit definition of SQL that is used to extract data for a specified record.

  The SQL should comply with the following requirements:

[1] Note, that it in the general case, it is not possible to determine the period lengths by looking at the previous record. Firstly, there will always be a first period (or last period), and it could be on more or less than twelve months, and secondly there could be information missing for a period (e.g. if the taxpayer did not file for the period).

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

- There must be a column indicating which taxpayer the data is for; this column is referred to as the <*taxpayerid-column*>.
- The actual name given to the <*taxpayerid-column*> must correspond to the value of the KeyCol attribute of the RecordTable element.
- The WHERE clause must include the clause: "<*taxpayerid-column*> = ?".
- There must be an ORDER BY clause ordering by <*taxpayerid-column*>.

The columns returned by the query must be mapped into dimension members or fields. The name of a column returned by the query must correspond to the name specified a) in the Column attribute of an element under the 'Keys for target cubes' element, or a name attribute of a Field element.

To illustrate, consider the following query:

SELECT tp_col as TaxpayerID, tp_Name as TaxpayerName FROM tp_basic WHERE tp_col=? ORDER BY tp_col

When processing the [RecordTable] element with the above explicit SQL query defined in the [Record Extraction SQL] attribute, the system binds the current taxpayer to the query by replacing the question mark (?). It subsequently executes the query, retrieves the data and continues processing it.

Note: Only one parameter (?) is allowed in the query and it should be used as illustrated above (to allow the system to bind the current taxpayer to the query).

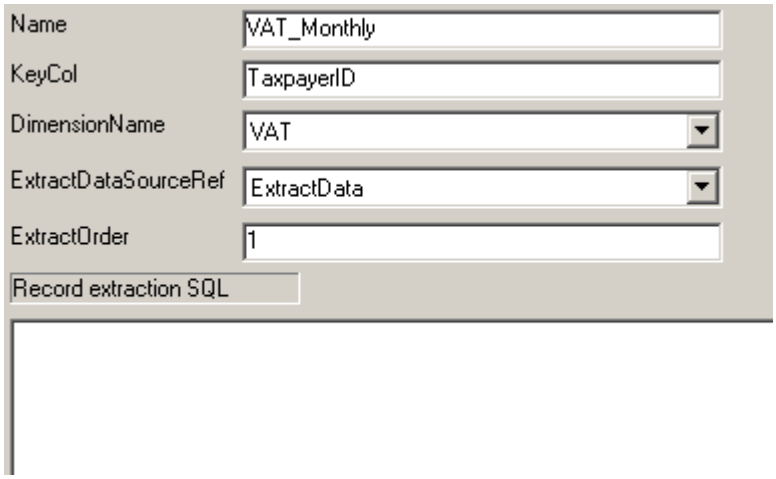
The benefit is that data formatting and processing can be applied at extraction time. To illustrate, see the following SQL query:

SELECT tp_col as TaxpayerID, tp_Name as TaxpayerName, Date_Part('Year',tp_RegDate) as Year FROM tp_basic WHERE tp_col=? ORDER BY tp_col

In this example, the year is retrieved from the tp_RegDate field.

Processing of data in the way illustrated above can also be handled by a view in the database.

See the example below:



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Here we entered the [TaxpayerID] field in the [KeyCol] attribute, since this field contains the registration number.

The structure pane will now reflect the name of the table entered in the [Name] attribute of the [RecordTable] element.

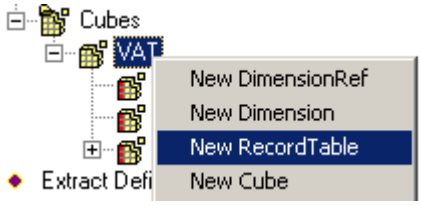
2.5.6.1 RecordTable under Cube Definitions

This function is rarely used in ESKORT Clearance Risk Analysis Systems; however it can be used when extracting data from external data sources. For that reason it is described in this section.

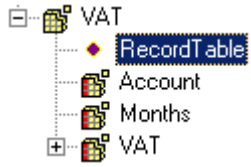
The example used in this section takes offset in a VAT cube having a dynamic Accounts- and Month-dimension.

It is also possible for the extract definition for the cube to be specified as part of the cube definition, rather that under the Extract Definition Element.

Make the cube the current element and select [New RecordTable] from the context menu.



A new [RecordTable] element is then inserted under the cube.



The definition of this [RecordTable] elements is then exactly as when defined under the [Extract Definition] element.

2.5.7 Keys for Target Cubes (mapping fields to dynamic dimensions)

This section describes how Keys for Target Cubes are used in a VAT cube example. Section 2.5.2.1 provides a description of the Keys for Target Cubes in a clearance context.

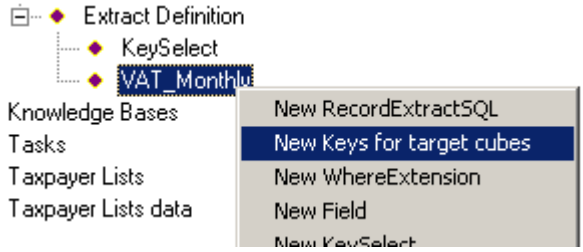
As explained before, a cube is spanned by a number of dimensions. Our VAT cube, for example has the following dimensions:

- Accounts – account dimension
- Months – period dimension
- VAT – measure dimension

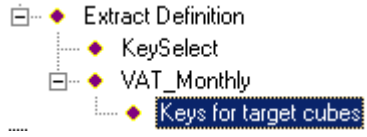
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Both Accounts and Months are dynamic and must be created and expanded based on the extracted data. How the system should do this can be defined using the [Keys For Target Cubes] element.

You can insert this type of element by making the [RecordTable] element in question (in our example VAT_Monthly) the current element and selecting [New Keys For Target Cubes] option in the context menu.



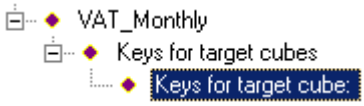
This will insert a new [Keys For Target Cubes] element.



Note that the first child of each [RecordTable] element should be this [Keys For Target Cubes] element.

Next, insert a [Keys For Target Cube] element by making the [Keys For Target Cubes] element the current element and selecting [New Keys For Target Cube] from the context menu.

A new [Keys For Target Cube] element will be inserted.



The [Keys For Target Cube] element has the following attribute:

- CubeName – name of the target cube.

See the illustration below:

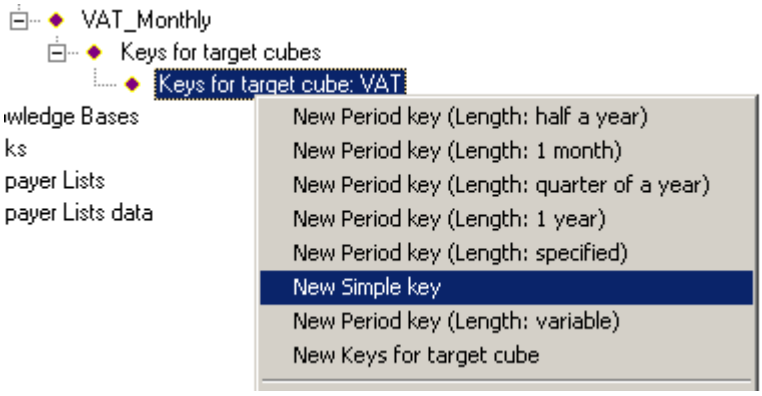
Next, individual fields from the VAT_Monthly table need to be mapped to the dynamic dimensions, which are (in our sample VAT cube):

- Accounts
- Months

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

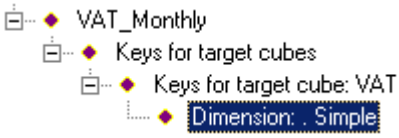
Note: It is suggested to map the fields in the order in which the relevant dimensions are defined in the cube definition. Our VAT cube has the dimensions Accounts, Months and VAT (in that specific order). Therefore we will first create a mapping for the Accounts dimension and then one for the Months dimension.

For mapping a field to the Accounts dimension a key element needs to be created. This can be achieved by making the [Keys For Target Cube] element in question the current element and selecting [New Simple Key] from the context menu.


VAT_Monthly
Keys for target cubes
Keys for target cube: VAT
wledge Bases
ks
payer Lists
payer Lists data
New Period key (Length: half a year)
New Period key (Length: 1 month)
New Period key (Length: quarter of a year)
New Period key (Length: 1 year)
New Period key (Length: specified)
New Simple key
New Period key (Length: variable)
New Keys for target cube

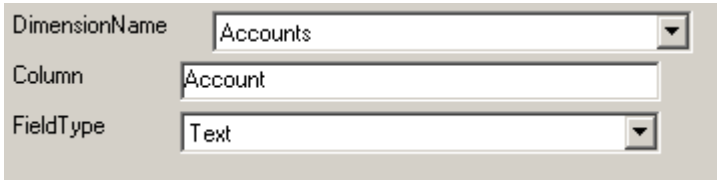
This will insert a new [Simple Key] element.

Simple Key should be used for all key elements that are not periods by nature.



This element has the following attributes:

- DimensionName – name of the (dynamic) dimension the field should map to.
- Column – name of the field.
- FieldType – data type of the field.

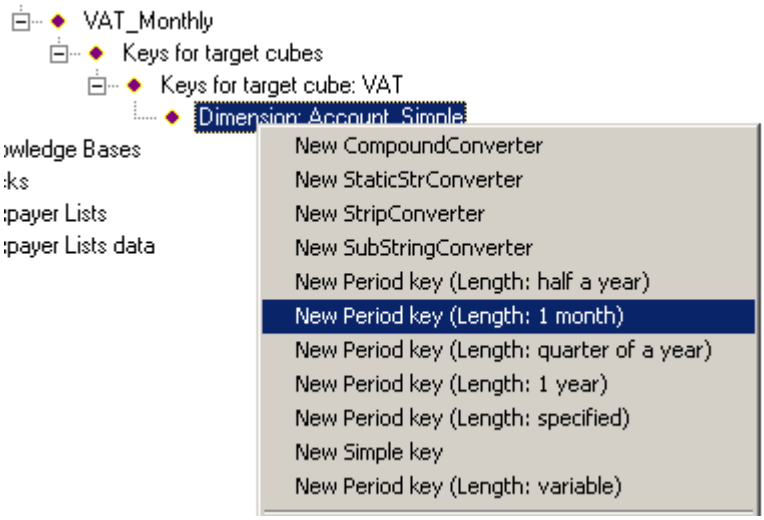


The structure pane will now look as follows:

Second, we need to map a field to the other dynamic dimension in our cube, which is the dimension Months (which is a period dimension).

Add a [Period Key] element by making the first [Simple Key] element the current element and selecting [New Period Key] from the context menu.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



This will add a [Period Key] element below the simple key created earlier.

This type of element has the following attributes:

- DimensionName - name of the (dynamic) dimension the field should map to.

Most [Period Key] elements have child elements. These are dependent of the length of the period:

- [Period Key] – length: half a year
  - Year – used to specify what field (or part of a field) identifies the year
  - Half a year number (1 or 2) – used to specify what field (or part of a field) identifies the half year
- [Period Key] – length: 1 month
  - Year – used to specify what field (or part of a field) identifies the year
  - Month – used to specify what field (or part of a field) identifies the month
- [Period Key] – length: quarter of a year
  - Year – used to specify what field (or part of a field) identifies the year
  - VarPeriodQuaterNumber – used to specify what field (or part of a field) identifies the quater
- [Period Key] – length: 1 year

  This [Period Key] does not have any child elements, but has two more attributes Column and FieldType used to specify what field (or part of field) and datatype that identifies the year.
- [Period Key] – length: specified

  This [Period Key] has two child elements; Start of period and end of period.
  - Start of period – used to specify what field (or part of a field) identifies the start of the period; year, month and optionally day.

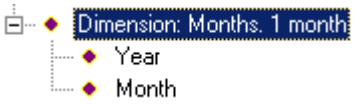
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

- End of period – used to specify what field (or part of a field) identifies the end of the period; year, month and optionally day.

- [Period Key] – length: variable

  This [Period Key] may have up to three child elements; Start of period, end of period and a month count to be used in the absence of one of the former mentioned fields. The month count field will only be used if either the start or the end of the period is undefined.
  - Start of period – used to specify what field (or part of a field) identifies the start of the period; year, month and optionally day.
  - End of period – used to specify what field (or part of a field) identifies the end of the period; year, month and optionally day.
  - VarPeriodMonthCount – used to specify the number of months in the period.

In our example use the length 1 month:



In our example, both the year and the month are in the [Month] field (VAT_Monthly table). The attributes for the [Year] and [Month] elements should therefore refer to the same column. See below:

2.5.7.1 Converters

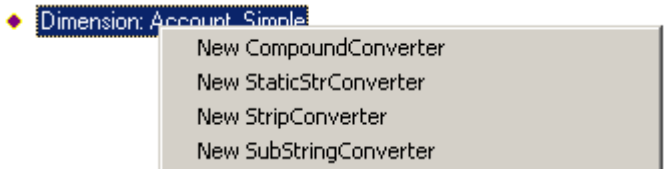
Converter elements allow us to process field contents. This can be necessary in cases where:

- The field in the database contains more information than we need – we only need part of the field to make our key.
- The field has some leading and/or trailing spaces (“blanks”) that we do not want to be part of our key.
- We want the key to be something specific in case the field in the database is empty.

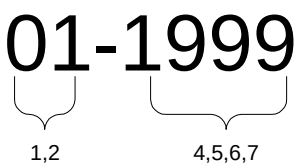
The available converters are:

- CompoundConverter – allows the definition of multiple converters where the output of one converter is used as input for the next.
- StaticStrConverter – allows specifying a static string.
- StripConverter – removes all leading and trailing spaces from the field.
- SubStringConverter – allows the use of only a part of the field.

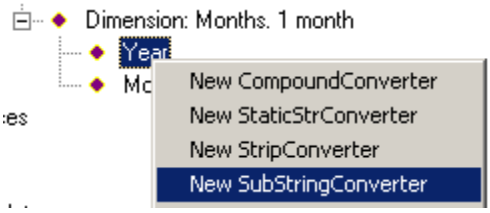
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



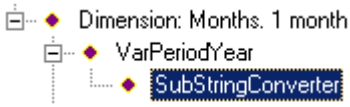
For an example the [Month] field has the following format: MM-YYYY, e.g. '01-1999'. So, in fact the year in question occupies positions 4,5,6 and 7 in the field. The month occupies positions 1 and 2. See below:



To instruct the system only to use part of a field for identifying the year, make the [Year] element the current element and select [New SubStringConverter] from the context menu.



This inserts a new [SubStringConverter] element.



A [SubStringConverter] element has the following attributes:

- Offset – used to specify the offset of the sub string
- Length – used to specify the length of the sub string

The illustration above would select positions 4,5,6 and 7 from the Month field.

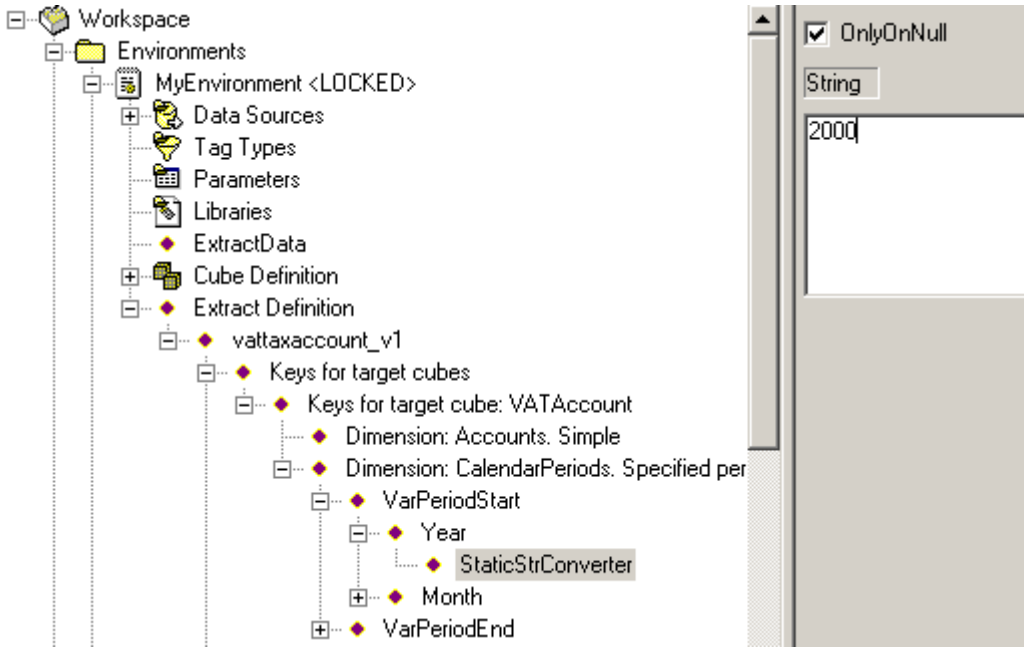
To select the month, we also insert a [SubStringConverter] element under the [Month] element.

Another example could be that we would like to use the year 2000 in case the field supplying the year is empty. We will therefore use the [StaticStrConverter].

The [StaticStrConverter] element has the following attributes:

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

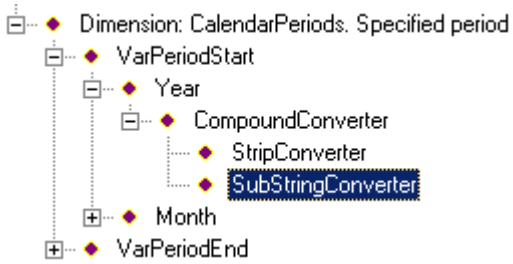
- OnlyOnNull – if checked, the string specified in the [String] attribute is only used if the field is NULL.
- String – (static) string to be used.



The system will now use the year 2000 in case the field supplying the year is empty.

Note: In general it is suggested to handle such situations in the database, either in the table(s) or by creating views that eliminate records that contain invalid data. Especially for fields that supply the data needed for constructing the dynamic dimensions it is very important that the data in the database is as good as possible.

As a third example of the use of converters consider the following:



Here a [CompoundConverter] element contains a [StripConverter] element and a [SubStringConverter] element.

The [StripConverter] element ensures that all leading and trailing spaces are removed from the field before it is being processed by the next converter, which is a [SubStringConverter] in the example.

2.5.8 Field Elements (mapping fields to measure dimension)

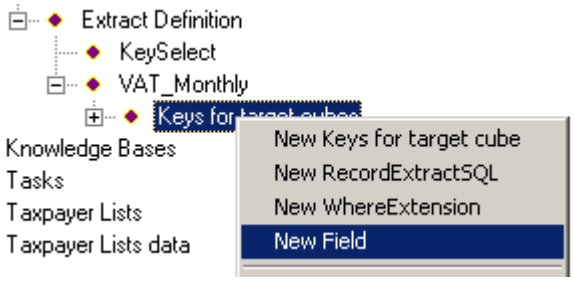
This section describes how Field Elements are used to map fields from the data source into the measure dimension. The description is taking offset in a VAT example used in Selection systems. Section 2.5.3 describes the Field Elements in Clearance systems.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

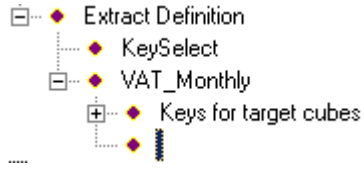
Field elements map fields in the table to members on the measure dimension. The advantage of this mapping is that field names need not be the same as the measure dimension member names.

In our example they will map fields from VAT_Monthly to the VAT dimension of the VAT cube.

To insert a Field element, make the [Keys For Target Cubes] element the current element and select [New Field] from the context menu.



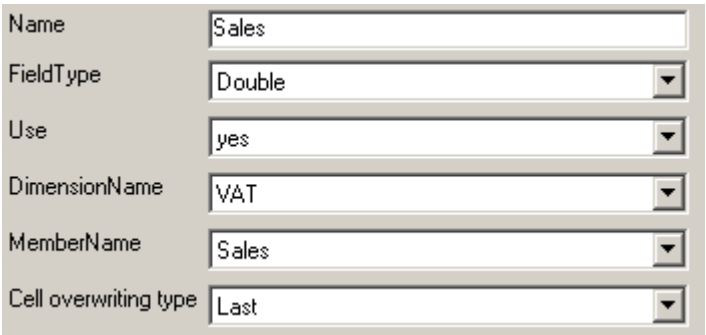
A new Field element will be inserted.



The [Field] element has the following attributes:

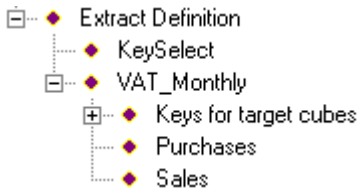
- Name – name of the field.
- FieldType – field type.

  The type should match the type used in the data source.
- Use – 'yes' implies that the field will be used.
- DimensionName – name of the dimension to map the field to.
- MemberName – name of the member to map the field to.
- CellOverwritingType – specifies how to handle multiple values. Possible types are:
  - Last – the last value is used.
  - Set – all values are included in a set.
  - Sum – the sum of all values is used.



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

After adding both ‘Sales’ and ‘Purchases’, the structure pane looks like this:



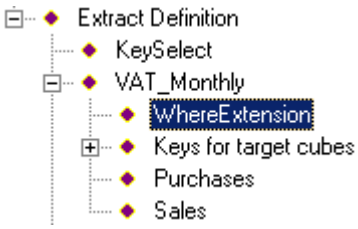
2.5.9 Where Extensions

The [Where Extension]-element are rarely used in ESKORT Clearance Risk Analysis Systems; however it can be used when extracting data from external data sources. For that reason it is described in this section.

The example used in this section takes offset in a VAT cube having a dynamic Accounts- and Month-dimension.

An optional (child) element of [RecordTable] elements is the [WhereExtension] element.

A ‘where extension’ is an addition to the where-clause of the SQL query the system will construct based on the extract definition for the table in question (as defined through the [RecordTable] element).



This mechanism therefore allows restriction of the rows that will be extracted from the database. Consider the following where-extension:

return_date <> ‘’

This extension assumes there is a field called ‘return_date’. Only rows for which this field contains a value qualify and will be extracted. The above demonstrates that a where-extension can help eliminating rows that contain invalid data in certain key fields (especially those referred to in the [Keys for Target Cubes] element).

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Alternatively it may serve as the mechanism to restrict the number of years being analysed by the system. See the following where-extension:

DATEPART('year',return_date) >= '1999'

This extension ensures that only rows after 1998 will be extracted.

2.5.10 AssociativeTable Element

The [Associative Table]-element are rarely used in ESKORT Clearance Risk Analysis Systems; however it can be used when extracting data from external data sources. For that reason it is described in this section.

The example used in this section takes offset in a VAT cube having a dynamic Accounts- and Month-dimension.

Consider that our VAT_Monthly table in the database is of the format:

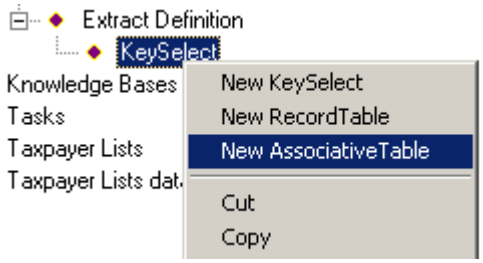
Account	Month	Field	Amount
341001	01-1999	Sales	100,00
341002	01-1999	Sales	20,00
341003	01-1999	Sales	500,00
341001	02-1999	Sales	110,00
341002	02-1999	Sales	18,00
341003	02-1999	Sales	550,00
341001	03-1999	Sales	130,00
341002	03-1999	Sales	25,00
341003	03-1999	Sales	540,00
341001	01-1999	Purchases	40,00
341002	01-1999	Purchases	10,00
341003	01-1999	Purchases	200,00
341001	02-1999	Purchases	45,00
341002	02-1999	Purchases	10,00
341003	02-1999	Purchases	250,00
341001	03-1999	Purchases	50,00
341002	03-1999	Purchases	15,00
341003	03-1999	Purchases	270,00

In this table the information about the field is part of the table data instead of being a column heading (at it is in the table in section 2.5.1).

A table where the field information is part of the table data is called an associative table.

This table will still populate our VAT cube with the three dimensions: Account, Month and VAT (measure). However we need to specify the extract definition differently, using the [AssociativeTable] element instead of the [RecordTable] element.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



This will insert a new [AssociativeTable] element.

The AssociativeTable element has the following attributes:

- Name – name of the table the data should be extracted from.
- KeyCol – the name of the key column. This should be the field that contains the registration number.
- FieldTypeColumn – the name of the column that contains the field information that determines the measure members.
- ExtractOrder – the order in which the system should process the various table elements. Refer to section 2.5.6 about [RecordTable] for an explanation about ExtractOrder, it is the same for both [RecordTable] and [AssociativeTable].

The [AssociativeTable] element has a child element [FieldTypeMapping].

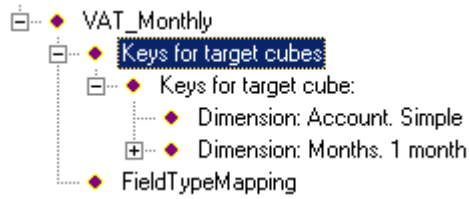
The [FieldTypeMapping] element has the following attributes:

- FieldType – field type.

  The type should match the real type.
- Column – name of the column that contains the field values (measures).

For [AssociativeTable] elements we should also define keys for target cubes as for [RecordTable] elements. This is done the same way, so refer to section 2.5.7 for a description of that.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



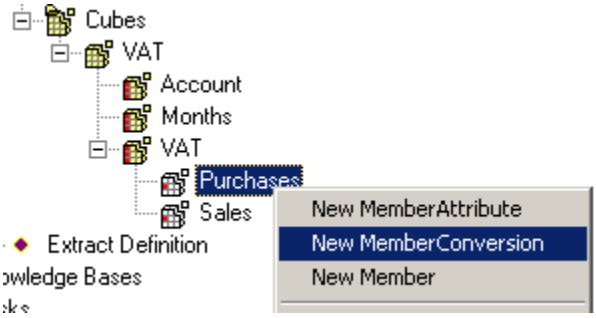
2.5.10.1 Member Conversion

The [MemberConversion]-element are rarely used in ESKORT Clearance Risk Analysis Systems; however it can be used when extracting data from external data sources. For that reason it is described in this section.

The example used in this section takes offset in a VAT cube having a dynamic Accounts- and Month-dimension.

When using associative tables we also need to insert a [MemberConversion] element as a child to each of the cube members in the measure dimension that are populated by the associative table.

To do so make the cube member the current element and choose [New MemberConversion] from the context menu.



This inserts a new [MemberConversion] element.

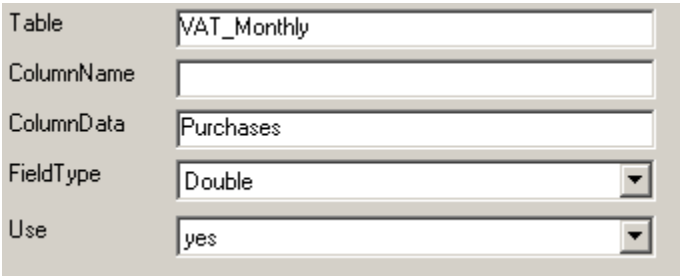
The [MemberConversion] element has the following attributes:

- Table – name of the table the data should be extracted from.
- ColumnName – the name of the column that contains the field information that determines the measure members.

  This can be left empty if the column name has been specified in the Field attribute of the [AssociativeTable] element.
- ColumnData – the column content that is used to map to this member.
- FieldType – field type.

  The type should match the real type.
- Use – ‘yes’ implies that the field will be used.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

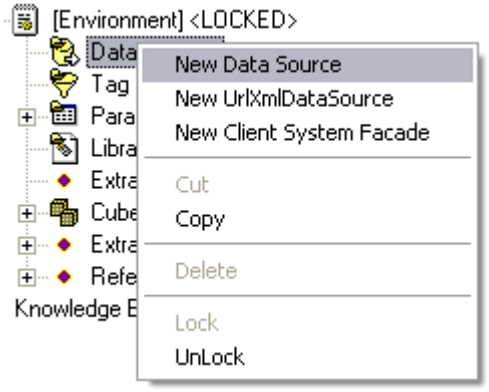


2.6 Data Sources

Data sources define references to the declaration documents received in real time for analysis (UrlXmlDataSource) as well as the databases where external data, are stored (DataSource).

2.6.1 Data Source

A new data source can be created by selecting the [Data Sources] folder in the structure pane of the Designer and selecting the [New DataSource] option in the context menu



This will add a new data source:

The [DataSource] element has the following attributes:

- Name – name of the data source definition (in the environment)
- DSN – name of the ODBC data source definition (as created through the windows control panel)
- UID – user id
- PWD – password
- Datasource JNDI – The JNDI name

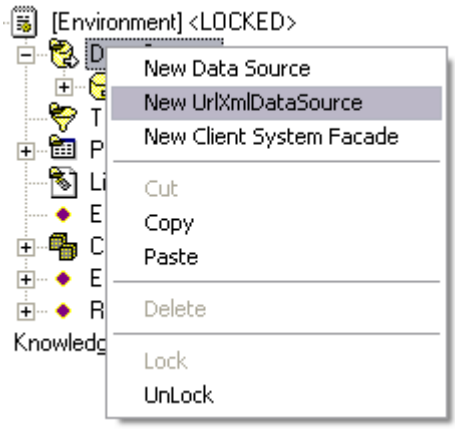
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

JNDI (Java Naming and Directory Interface). JNDI is a standard extension to the Java platform, providing Java-enabled applications with a unified interface to multiple naming and directory services in the enterprise. The JNDI name is used to indicate to the system's JAVA-modules which database the configuration element data is located.

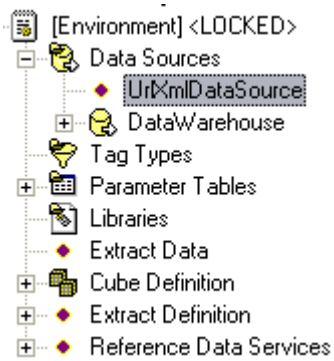
Most typically, one data source definition points to the data warehouse containing all declaration data. Another data source definition may access a database containing external data.

2.6.2 UrlXmlDataSource

A new UrlXmlDataSource can be created by selecting the [Data Sources] folder in the structure pane of the Designer and selecting the [New UrlXmlDataSource] option in the context menu



This will add a new UrlXmlDataSource:



The UrlXmlDataSource has the following attributes:

- Name – name of the UrlXmlDataSource definition (in the environment)

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

URL – the temporary location of the declaration being analysed. When a declaration is received from the client system, the declaration is converted into a temporary file located at the actual ESKORT Analysis Server. The URL defines the location relative to the root directory of the actual ESKORT Analysis Server. Most typically the URL is “Clearance Config/declaration.xml”; however it depends on the actual implementation.

2.7 Reference Data Services

Reference Data Services are used for defining data services used by the ESKORT Clearance Risk Analysis System for validating at and retrieving data. E.g. this could be validation of country codes entered by the user using ESKORT Clearance Workbench or it could be retrieval of the customs office to which the ESKORT Clearance Workbench user belongs.

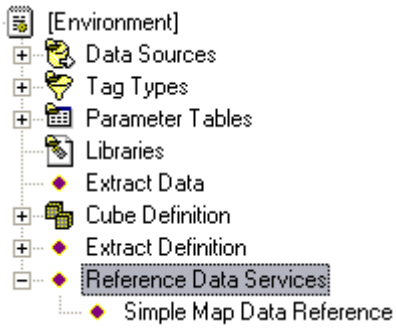
The Reference Data Services are usually available on external systems; however if this is not the case Reference Data Services can be defined locally in the ESKORT Clearance Risk Analysis System.

One distinct specific Reference Data Services is used by the Clearance Services[2], i.e. UserOfficeRef.

Reference Data Services can be used from the Parameter Tables to perform data validation or to retrieve extra information e.g. the country name connected to a specific country code.

When the ESKORT Clearance Risk Analysis System uses a Reference Data Service it calls the Reference Data Service by a name describing the requested function supplied with data input (parameters), the Reference Data Service is then expected to reply back with output data (return values).

As shown in the figure below the [Reference Data Services]-element is located below the [Environment]-element.



The [Reference Data Services]-element is the container for Reference Data Service-elements.

[2] Clearance Services is the middleware to which ESKORT Clearance Workbench communicates. The Clearance Services is located at the server site.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Note that [Reference Data Services]-element already contains the mandatory [Simple Map Data Reference]-element. The [Simple Map Data Reference]-element is a placeholder for definitions of Simple Data Maps, where each Simple Data Map has it own function name. The mapped values are directly entered in the ESKORT Designer and used by the ESKORT Clearance Risk Analysis System without accessing any external system. For that reason the Simple Data Maps can be used if the ESKORT Clearance Risk Analysis System should be a standalone system or for implementing services that are unsupported by the external system.

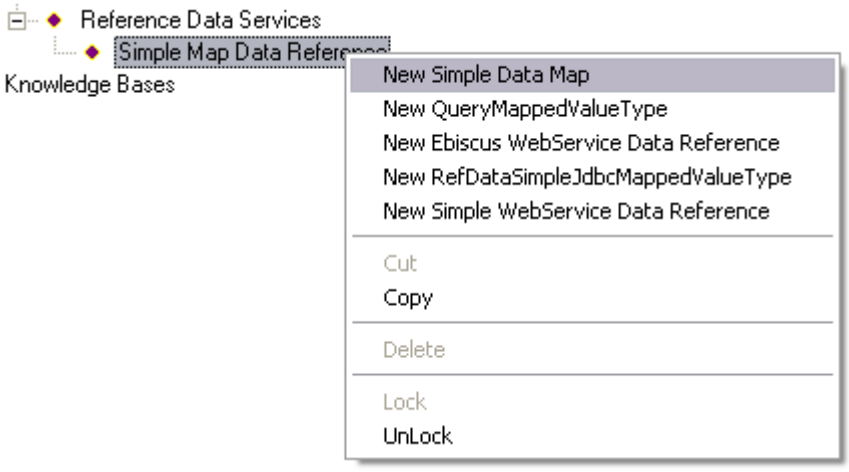
A good approach could be to start out by configuring all the required services in the [Simple Map Data Reference]-element and subsequently test the configuration by using ESKORT Clearance Workbench. Afterwards the real services to external systems can be configured one by one by making them substitute the equivalent services in the [Simple Map Data Reference]. The next section describes how services are configured in the [Simple Map Data Reference].

The "real"-services or rather services that is accessed in external systems can be added to the [Reference Data Services]-element. The procedures to do so are described in the subsequent sections.

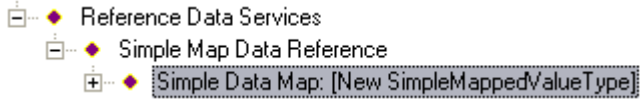
2.7.1 Simple Map Data Reference

The [Simple Map Data Reference]-element already exists as a child-element to the [Reference Data Services]-element in the structure pane of the ESKORT Designer.

A new service can be created by selecting the [Simple Map Data Reference]-element in the structure pane and then selecting the [New Simple Data Map] option in the context menu.



This will insert a new [Simple Data Map]-element.



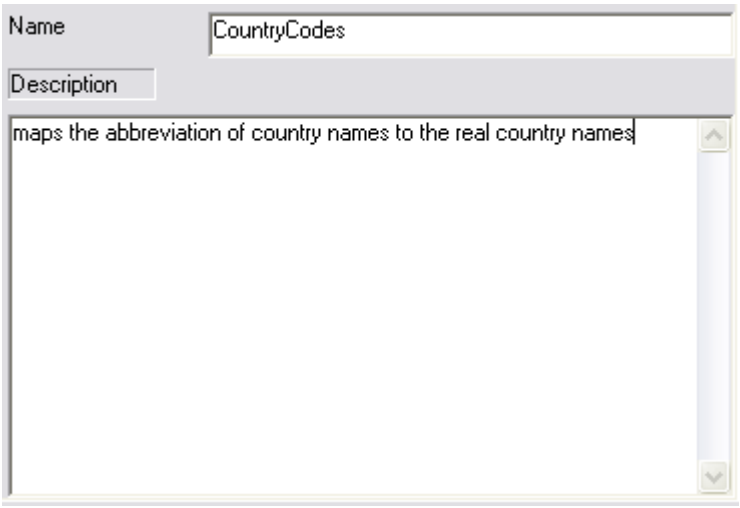
A [Simple Data Map]-element has the following attributes:

- Name – the name of the service. All requests to this service is done by calling this name
- Description – Description for your own purpose

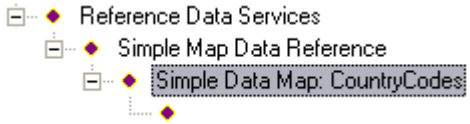
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Consider an example where we want to create a map called “CountryCodes” that maps the abbreviation of country names to the real country names, e.g. “DK” maps to “Denmark”, “UK” maps to “United Kingdom”, etc. Each of these mappings is expressed by a child-element below the [Simple Data Map]-element.

As a beginning, let us fill the service name “CountryCodes” into the [Simple Data Map]-element and give it a description.



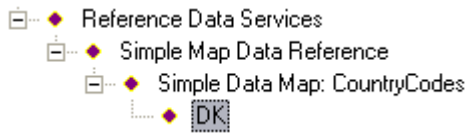
Note that the name of the [Simple Data Map]-element changes according to the entered name.



The [Simple Map Data Reference]-element already contains one, empty sub-element (mapped value) in fact this was made during the creation of the [Simple Map Data Reference]-element.

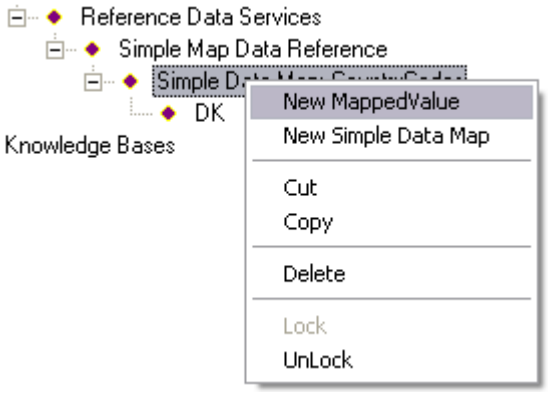
The element can be filled by the fist mapping (“DK -> “Denmark”).

After this the elements in the structure panel looks like this:



Additional map values can be created by selecting the [Simple Data Map: CountryCodes]-element and selecting the [New MappedValue] option in the context menu.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



This will insert a new mapped value. Like for the previous mapped value we can fill the "UK" -> "United Kingdom" into the element. Hereafter the structure panel will look like this:

Additional map values can be added by in the same manner.

2.7.2 Query Mapped Data Reference

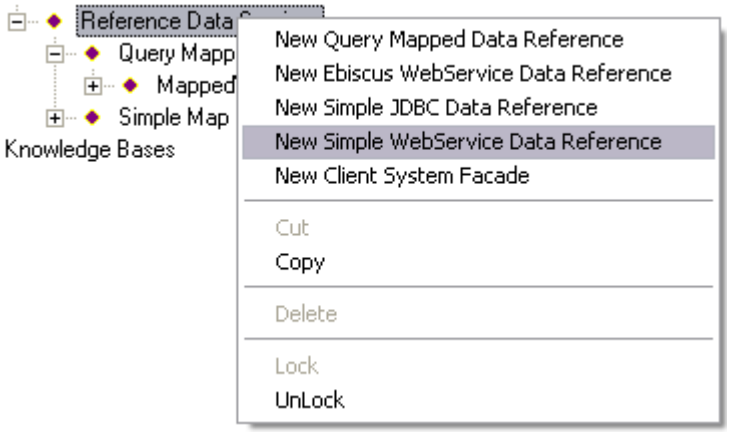
A [Query Mapped Data Reference] is not implemented.

2.7.3 Ref Data Simple WebService Data Reference

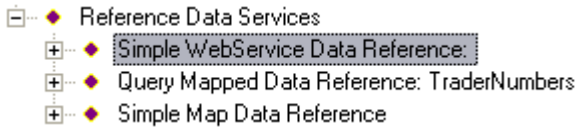
A [Ref Data Simple WebService Data Reference] is used to access a simple WebService for data mapping. Each Ref Data Simple WebService Data Reference points to one specific WebService. You must specify the actual data mapping that the ESKORT Clearance Risk Analysis System uses from the WebService. You can do that by adding [New Simple WebService Data Set] to the [Ref Data Simple WebService Data Reference].

Let us consider the situation where we would like to use a WebService provided for us at the URL http://172.29.80.38:12204/WebServices/EskortStubws for mapping usernames to customs office codes. First we need to create the [Ref Data Simple WebService Data Reference]-element. A new [Ref Data Simple WebService Data Reference]-element can be created by selecting the [Reference Data Services]-element in the structure pane and selecting the [New Simple WebService Data Reference] option in the context menu.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

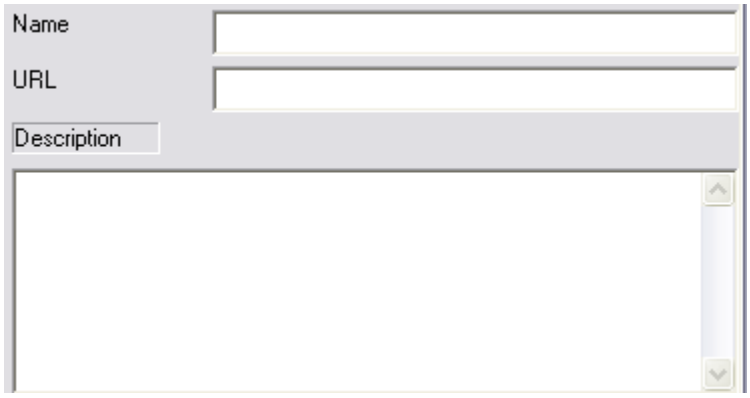


This will insert a [Simple WebService Data Reference]-element.


Reference Data Services
Simple WebService Data Reference:
Query Mapped Data Reference: TraderNumbers
Simple Map Data Reference

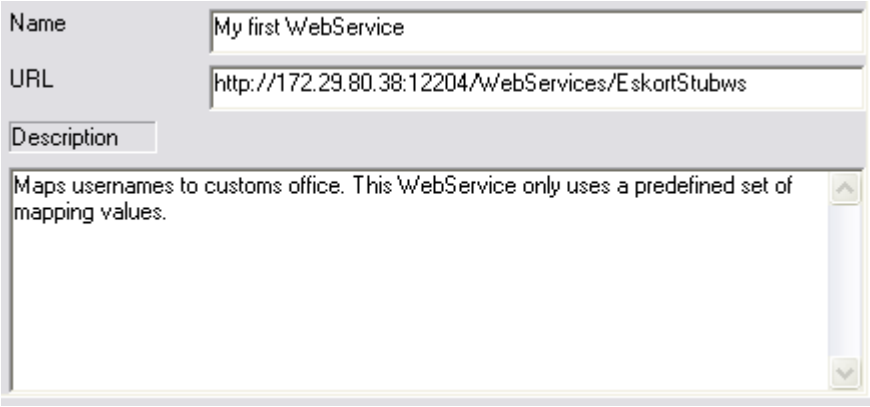
The [Simple WebService Data Reference]-element have the following attributes:

- Name – the name of the service. Naming of the service for your own purpose.
- URL – The network location of the WebService that exposes the reference data services.
- Description – Description for your own purpose

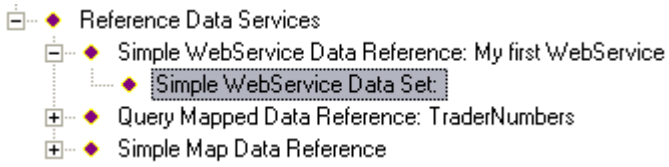


We will call the service “My first WebService”. We will then enter the values so the screen looks like this:

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



The next step is to define how the WebService is going to do the mapping of the usernames into customs offices. For that purpose we need use a Simple WebService Data Set. Note that when we created the [Simple WebService Data Reference]-element an empty [Simple WebService Data Set]-child-element was already added, so we just have to fill that with the right values.


Reference Data Services
Simple WebService Data Reference: My first WebService
Simple WebService Data Set:
Query Mapped Data Reference: TraderNumbers
Simple Map Data Reference

The [Simple WebService Data Set]-element contains the following attributes:

- Name – the name of the data reference. Naming of the service for your own purpose
- Data Set - the name of the service. All requests to this service is done by calling this name
- Name Space – the name space is used for making the WebService unique at the network (e.g. the Internet). If you do not know the name space you must obtain it from the WebService provider or the personnel that deploys the WebService.
- Method – the method (service or function) provided by the WebService that you will use to perform the mapping. The method name must be obtained at the WebService provider.
- Parameters – indicates the type of parameters that the ESKORT Clearance Risk Analysis System will pass to the WebService when a mapping is requested. Because we always maps one value to one or more values we only need to specify one type. You must obtain the specific type from the WebService provider. The ESKORT Clearance Risk Analysis System uses the specified type to convert the key for the mapping into the specified type.

An example of attributes is shown below:

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

In case you need to access more methods for mapping from the same WebService you can do that by inserting additional [Simple WebService Data Reference]-elements.

Note that

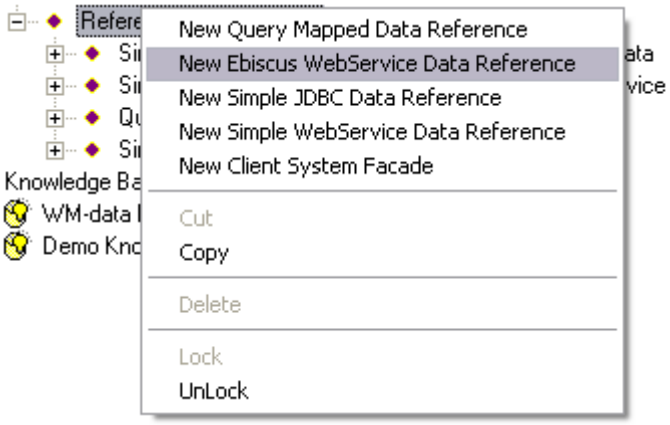
2.7.4 Simple JDBC Data Reference

The [Simple JDBC Data Reference] is not implemented.

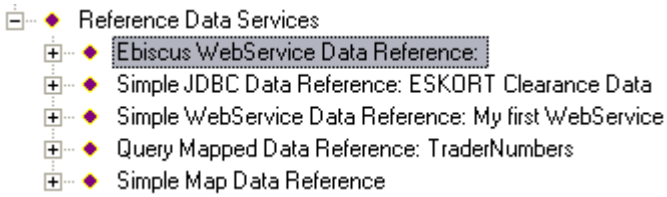
2.7.5 E-biscus WebService Data Reference

The E-biscus WebService Data Reference has been developed to implement a specific WebService interface provided by Bull's e-biscus-system.

A new biscus WebService Data Reference can be created by selecting the [Reference Data Services]-element in the structure pane and selecting the [New Ebiscus WebService Data Reference] option in the context menu.



This will insert a new [Ebiscus WebService Data Reference:]-element.

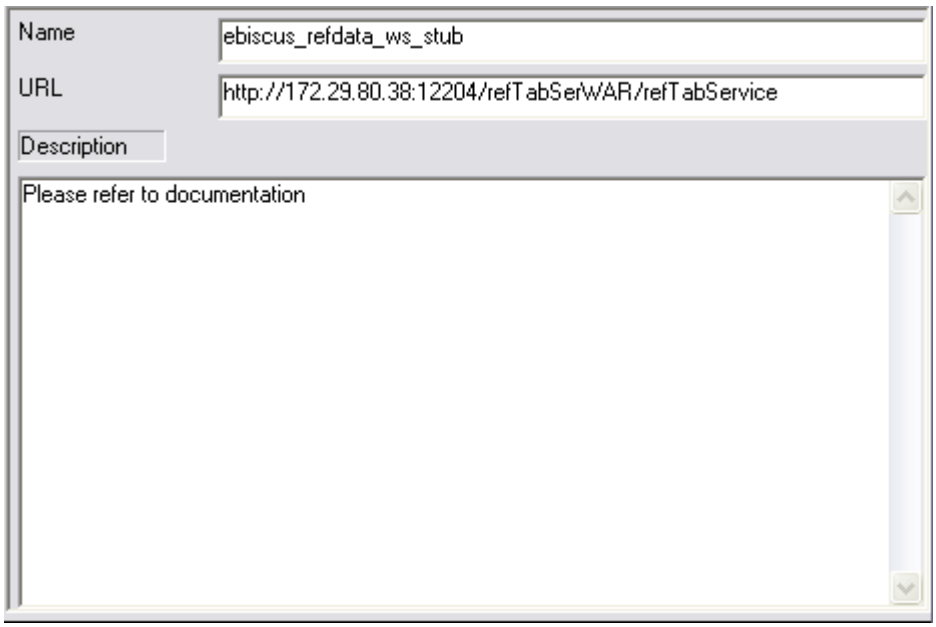

Reference Data Services
Ebiscus WebService Data Reference:
Simple JDBC Data Reference: ESKORT Clearance Data
Simple WebService Data Reference: My first WebService
Query Mapped Data Reference: TraderNumbers
Simple Map Data Reference

The new element has the following attributes:

- Name – the name of the service. Naming of the service for your own purpose.
- URL – The network location of the WebService that exposes the reference data services.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

- Description – Description for your own purpose



Note that the creation of the new [Ebiscus WebService Data Reference:]-element automatically inserted an empty child-element. The child element contains the following attributes:

- Name – the name of the service. All requests to this service is done by calling this name.
- Data Set – the name of the e-biscus data set provided.

Please refer to the e-biscus documentation for more details about how to access the data sets defined by e-biscus.

2.8 Client System Facade

The Client System Facade is a Stylesheet used for pre-processing the XML-declaration received for risk analysis by the ESKORT Clearance Risk Analysis System.

In general a Stylesheet is an XML-based definition of a transformer-process that transforms a XML-document into a new XML-document, a HTML-document, e text-document, etc.

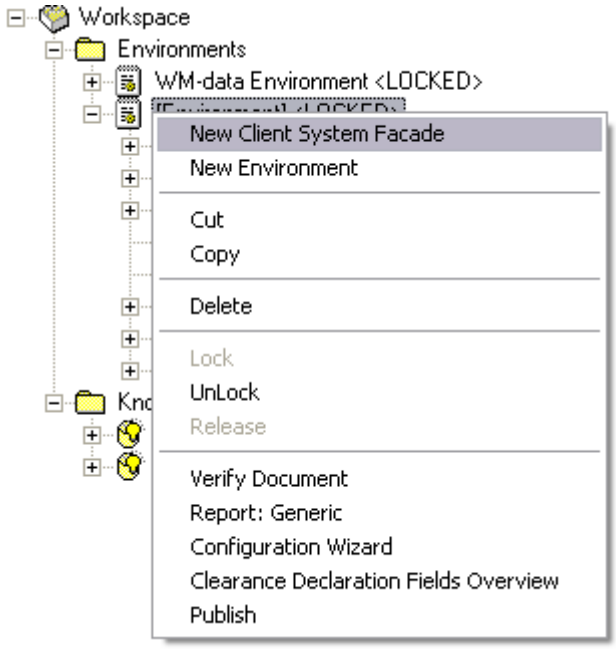
For more information about Stylesheets please refer to http://w3c.org.

The pre-processing can be convenient for manipulating the XML-structure in case the original format differs in structure so it is impossible or to complex to retrieve the data by the use of the Record XML Sources. Also if some new fields should be created from the declaration by combining information within the declaration a Stylesheet transformation can be useful. E.g. if a the values for a static dimension is a combination of several fields inside the XML-declaration a concatenation of the fields will generate a new field that can be used as an unique identifier for the static dimension.

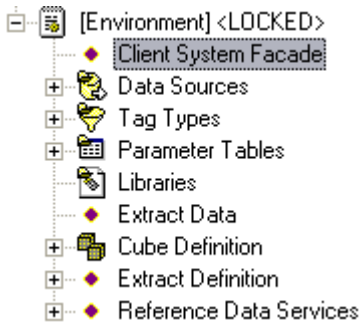
In the ESKORT Designer the Stylesheet for converting the incoming XML-declarations can be defined by adding a [Client System Facade]-element to the [Environment]-element. A new [Client System Facade]-element can be created by selecting the [Environment]-

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

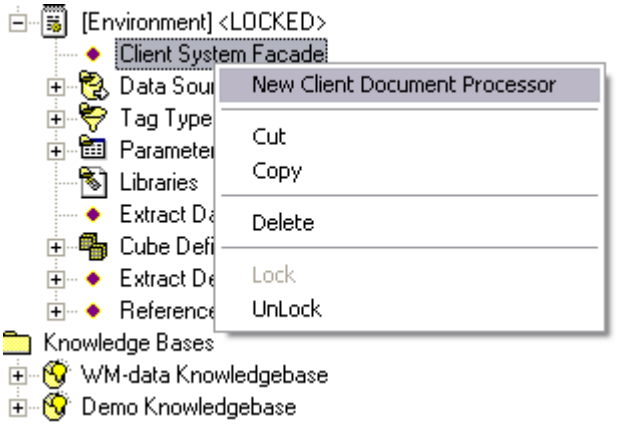
element in the structure pane and selecting the [New Client System Facade] option in the context menu.



This will insert a new [Client Facade]-element.

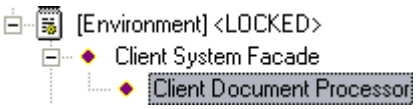


Subsequently you can to add a [Client Document Processor]-element to the new [Client System Facade]-element. A new [Client Document Processor]-element can be created by selecting the new [Client System Facade]-element in the structure pane and selecting the [New Client Document Processor] option in the context menu.



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

This will insert a new [Client Document Processor]-element.



The [Client Document Processor]-element contains only one attribute, i.e. the Stylesheet.

In case you do not need any XML-declaration pre-processing to be performed you must create the [Client Document Processor] with a copy-Stylesheet. A copy-Stylesheet performs a one-to-one mapping, meaning that the processor creates an output equivalent to the input. A copy-Stylesheet looks like this:

```
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"  version="1.0">

 <xsl:output method="xml" encoding="utf-8" indent="yes"/>
 <xsl:preserve-space elements="*"/>

 <xsl:template match="/ | @* | node()" priority="1">
  <xsl:copy>
   <xsl:apply-templates select="@* | node()"/>
  </xsl:copy>
 </xsl:template>

</xsl:stylesheet>
```

2.9 Tag Types

Tag types are used to define the filter types and their values, which need to be available in rules. It is possible to insert three different types of tag type-elements below the Tag Types-element. These are:

- Tag Type Values
- Template Groups
- Inspection Scope Lists

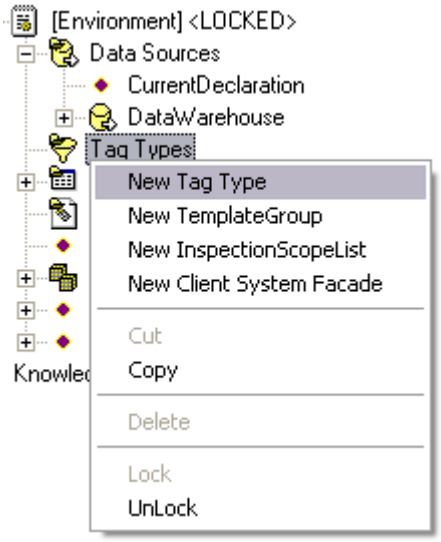
The three types are described in the following sub-sections.

2.9.1 Creating Tag Type Values

Tag Type Values are rarely used in ESKORT Clearance Risk Analysis Systems; however they can be used when extracting data from external data sources.

A new tag type can be created by selecting the [Tag Types] folder in the structure pane of the Designer and selecting the [New TagType] option in the context menu.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



This will insert a new tag type.

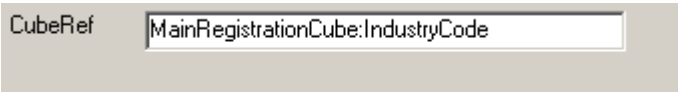
A [TagType] element has the following attributes:

- Name – name of the tag type
- TagClass – type of tag. Currently, only the type 'filter' is used.

Consider the example below. Here a tag type has been defined called IndustryCode. The purpose of this tag type would be to be able to define filters on types of industries.

Next, the member containing the industry code needs to be entered in the [CubeRef] attribute of the [Cell Reference] element (which is a child to the newly entered tag type).

Assuming we have a cube called 'MainRegistrationCube' with a member called 'IndustryCode', [CubeRef] should look like this:



2.9.1.1 Tag Type Values

Tag type values need to be defined either explicitly (using [Tag] elements) or implicitly [using the [TagSource] element).

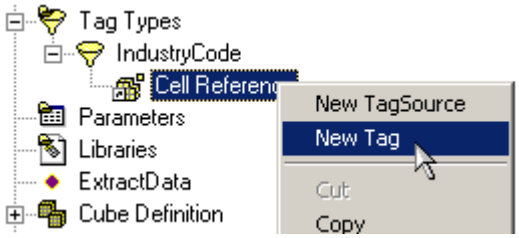
Implicitly defined tag type values are stored in a database. The [TagSource] element defines the location of these values. Explicitly defined tag type values are listed in the environment itself.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Whether to use explicitly or implicitly defined tag type values is mainly a question of what would be most convenient. In case only a limited number of tag type values exist, it may be easiest to define them explicitly. If there are many values, they may be easiest to maintain in a table in a database.

2.9.1.1.1 Explicitly Defined Tag Type Values

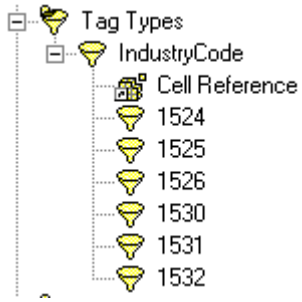
A new tag type value can be inserted by selecting the [Cell Reference] element in the structure pane of the Designer and selecting the [New Tag] option in the context menu.



This will insert a new [Tag] element, which has the following attribute:

- Value – used to specify the value of the tag

In the same fashion more tags may be added. See below for an example of the structure with multiple tags:



2.9.1.1.2 Implicitly Defined Tag Type Values

To define tag type values implicitly, a new [TagSource] element must be inserted.

This can be achieved by making the [Cell Reference] element the current element and then to select the [New TagSource] option in the context menu.

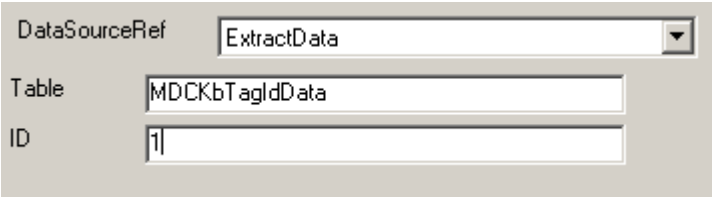
This will insert a new [TagSource] element.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

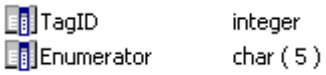
A [TagSource] element has the following attributes:

- DataSourceRef – name of the data source definition.
- Table – name of the table containing the values
- ID – unique identifier, used to identify the vales

See the example below:



In principle, the values could be stored in any database and in any table, as long as they are accessible and the table has the following two columns:



All values associated with the same tag type must receive the same TagID.

Note that the ESKORT Standard Selection system includes a definitions database (Defs) that can be used for the purpose of maintaining tag type values. The table for storing the values is called ‘MDCKbTagIdData’ (see also example above).

See below for an example of what this table could contain:

TagID	Enumerator
1	862
1	863
1	864
1	865
1	866
1	867
1	869
1	881
1	891
1	892
1	893
1	899
1	919
1	929
1	939
1	949
1	959
1	969
1	999
2	10
2	20
2	23
2	30
2	33
2	34

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

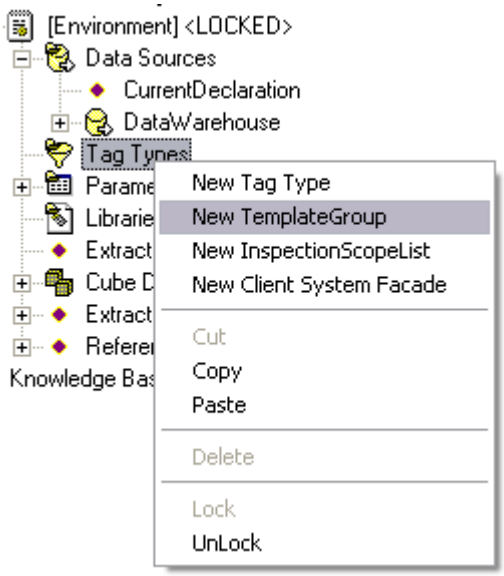
Note that the table can contain multiple tag types.

2.9.2 Template Groups

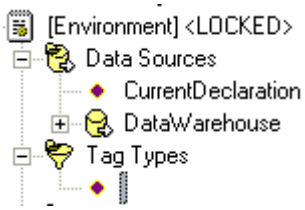
In the ESKORT Clearance Risk Analysis System template groups are used to define the various declaration types along with the common conditions for when trap rules should fire, e.g. the customs office to which the trap rule belongs. This is done by adding one [Template Group]-elements to the Tag Types for each declaration group that is intended to be shown in the ESKORT Clearance Workbench.

A [Template Group]-element can contain a hierarchal sub-structure of [Template Group]-elements. In the ESKORT Clearance Workbench the hierarchy is displayed along with trap rules. The hierarchy is displayed in the filter-panel as well as when the user is selecting the declaration types covered by the trap rules. The top-most [Template Group]-element is used as the root node for all the sub-elements and is displayed in the ESKORT Clearance Workbench. For that reason the name of the top-most element it must be considered convenient to provide it with a name like: “Main”, “Root”, “Group”, etc.

A new [Template Group]-element can be created by selecting the [Tag Types] folder in the structure pane of the ESKORT Designer and selecting the [New Template Group] option in the context menu.



This will insert a new [Template Group]-element.



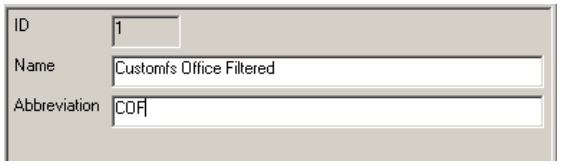
A [Template Group] element has the following attributes:

- ID – unique identifier, used to identify the template group. The value is system generated and cannot be changed.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

- Name – the name of the template group. (The name of the [Template Group]-element displayed in the structure pane aligns to this name.
- Abbreviation – An (optional) abbreviated version of the name used in the ESKORT Clearance Workbench for listing declaration types in the list view of risk profiles. If omitted the ID will be used.

See the example below:



A [Template Group]-element can contain [Template Group]-elements as child elements and [Condition Code]-elements. When the ESKORT Clearance Workbench user creates a new trap rule the user can select a combination of template groups to which the trap rule should apply. The user is only capable of selecting the leaf-template groups in the template group hierarchy. The leaf-template groups are the final declaration types defined in the system.

The [Condition Code]-elements are conditions applied to the trap rules of the type [Template Group]-element to which it is a child node.

When the ESKORT Clearance Workbench user selects a declaration type all the condition codes above the template group defining the declaration type is combined and applied to the rule defined by the trap rule.

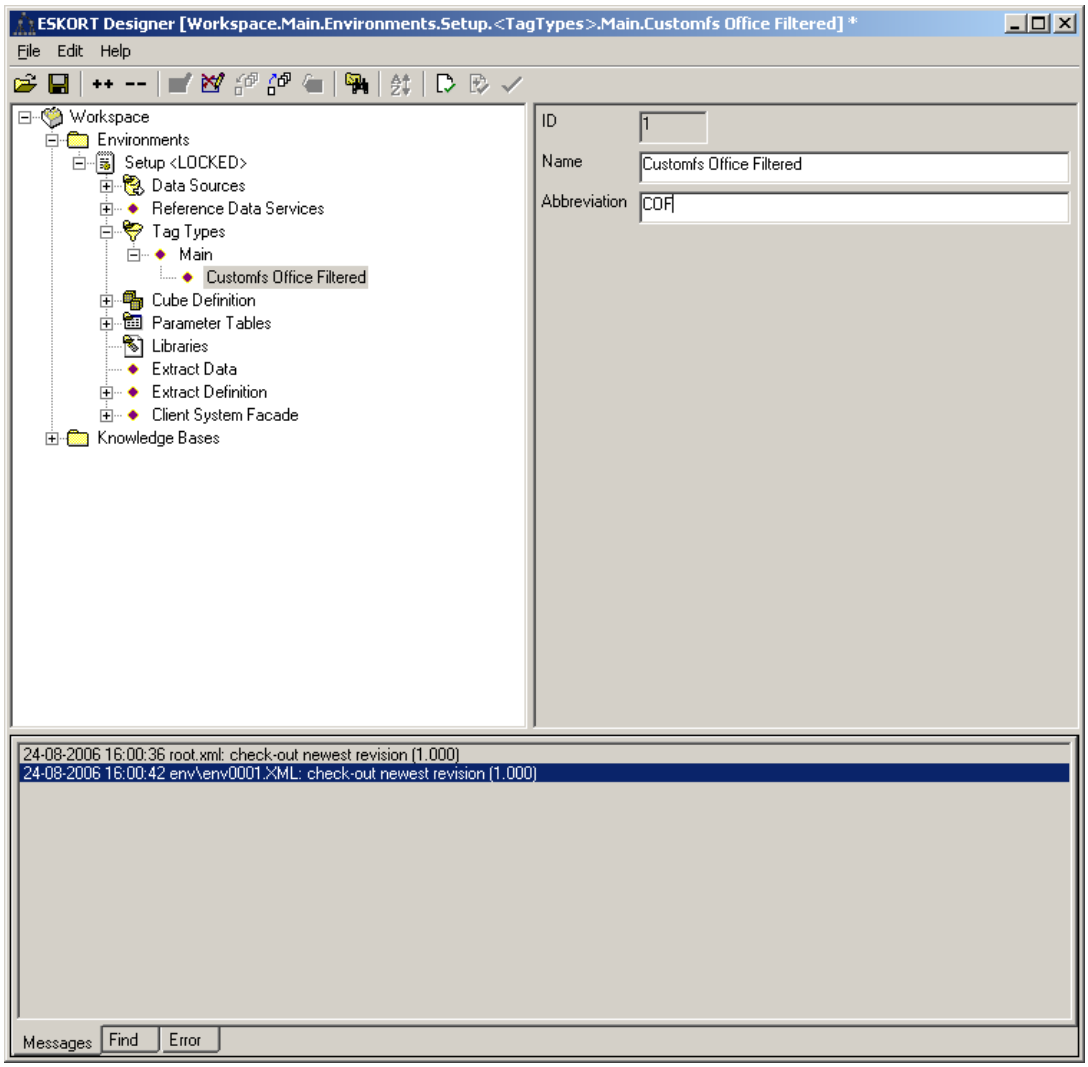
If the user selects more than one declaration type for a trap rule the combined conditions are combined in such a way that the trap rule works like if there were made one trap rule for each of the selected declaration types.

As an example let us imagine that we want to configure two manifest declaration types: Air Cargo and Sea Cargo that only applies to declarations for customs office to which the user who creates the trap rules belongs. Further more we would like to make one special manifest declaration type that applies to all Air Cargo without any customs office conditions.

Let us start with creating the customs office filtering declaration types. We start out by creating a [Template Group]-element common for the custom office filtering declaration types.

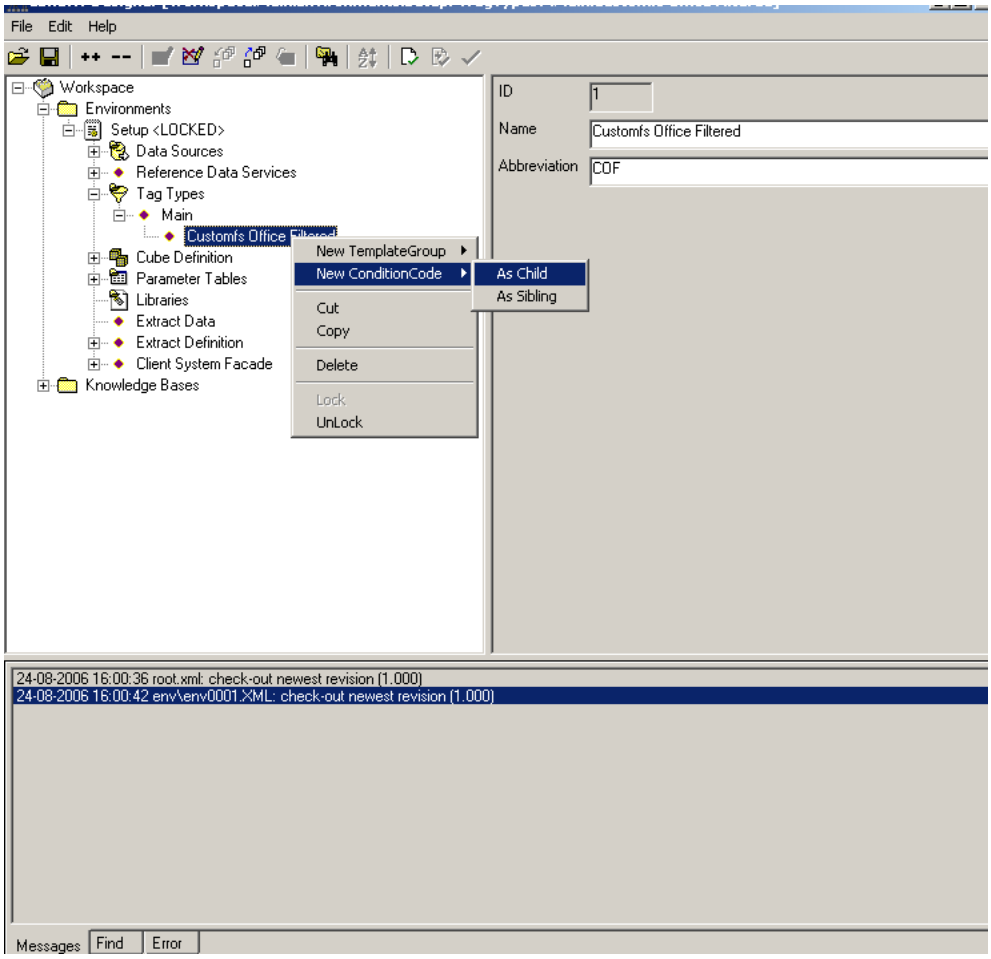
We assume that we have already created the root-node and called it “main”. From the context menu on the “main”-[Template Group]-element we create a new [Template Group]-element and calls it “Customs Office Filtered”.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



New let us insert a [Condition Code]-element below the new [Template Group]-element. This is done by selecting [New ConditionCode] from the context menu of the new [Template Group]-element.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

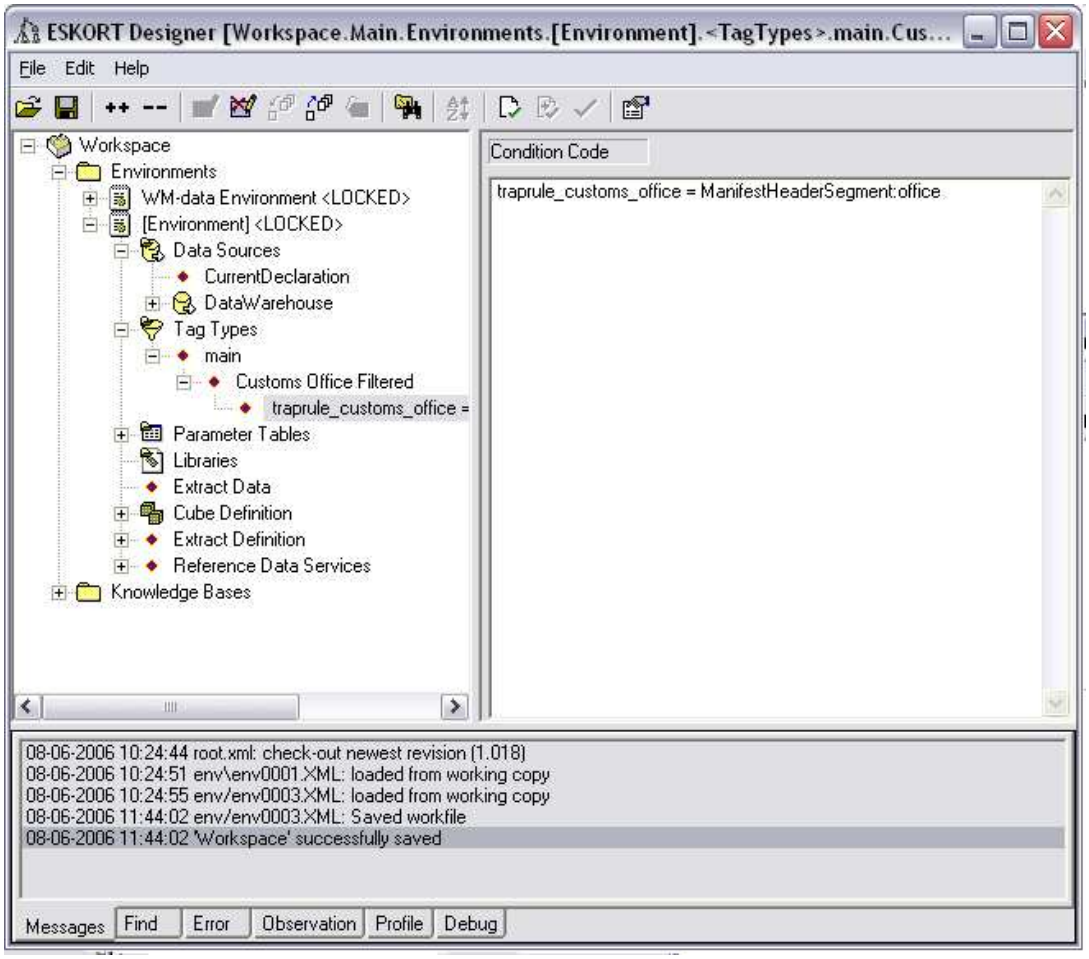


The [Condition Code]-element contains one attribute – this is the code for the condition. The code is a Boolean expression (an expression that evaluates either true or false).

When a trap rule is being evaluated the variable traprule_customs_office contains the office code of the office to which the user who created the trap rule belongs. By comparing that with the office located on the ManifestHeaderSegment-cube the condition will only be true if the user's customs office matches the office on the manifest declaration. Hence we enter the code:

traprule_customs_office = ManifestHeaderSegment:office

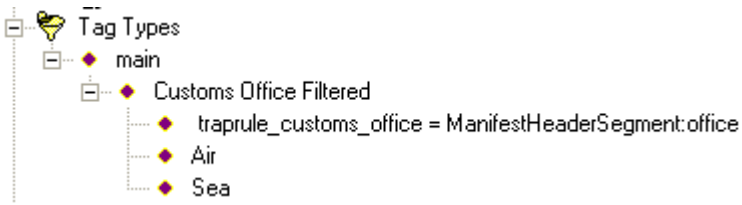
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



Note that after we have entered the condition and leaves the field the name of the [Condition Code]-element is updated in the structure panel.

If we now published the environment the ESKORT Clearance Workbench would only allow us to create trap rules of one declaration type, which would be “Customs Office Filtered”. The following created trap rules would apply to all declarations which customs office matches the user’s customs office. However we would also like to distinguish between Air and Sea manifests. For that reason we adds additional two [Template Group]-elements below the “Customs Office Filtered”-template group. We name one “Air” and the other “Sea”. We do that the same way by which we created the “Customs Office Filtered”-template group.

Hereafter the structure panel should look like this:



The condition for “Air” is that the manifest being analysed is an Air-manifest. This is the case if the type-member on the ManifestHeaderSegment-cube contains the letter “A”. For

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

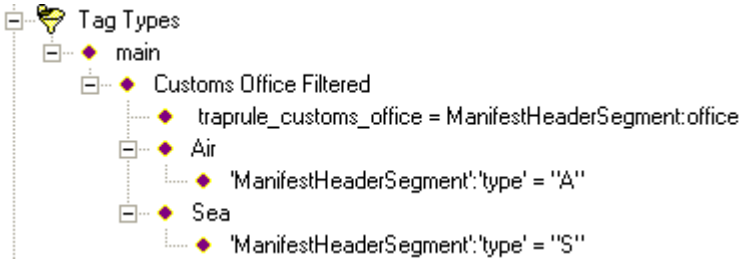
that reason let us create a new [Condition Code]-element below the new “Air”-template group expressing the condition:

ManifestHeaderSegment:type = “A”

Sea manifests are recognised by the letter “S”, so let us insert a similar [Condition Code]-element below the “Sea”-template group-element with the condition:

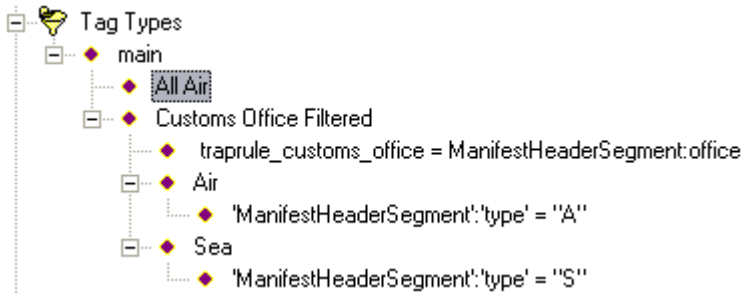
ManifestHeaderSegment:type = “S”

After doing this the structure panel looks like this:



We have now defined the declaration types for Air Cargo and Sea Cargo that only apply to manifest declarations for customs office to which the user who creates the trap rules belongs.

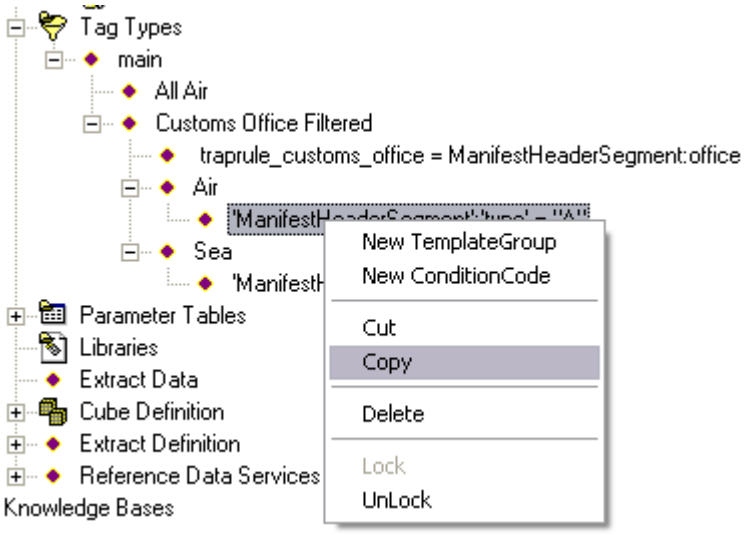
The last exercise is to make one special manifest declaration type that applies to all Air Cargo without any customs office conditions. Because this has nothing to do with the ManifestHeaderSegment:office-member – for that reason we must create a new [Template Group]-element as a direct child of the “main”-element. We do that similar to the way we created the “Customs Office Filtered”-element. Hereafter the structure panel looks like this:



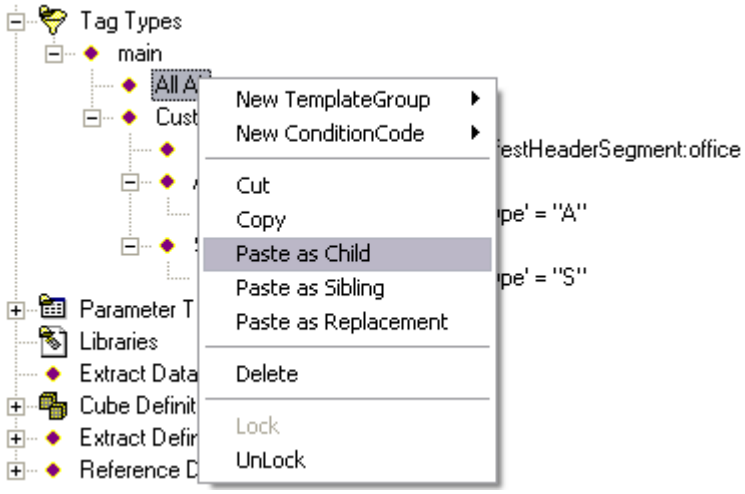
The condition for all “All Air”-manifests are the same condition as the one we previous specified for “Air”. Let us copy the [Condition Code]-element below the “Air”-element and insert it below the “All Air”-element. This is done in the following way:

Select “Copy” on the context menu of the [Condition Code]-element located below the “Air”-element.

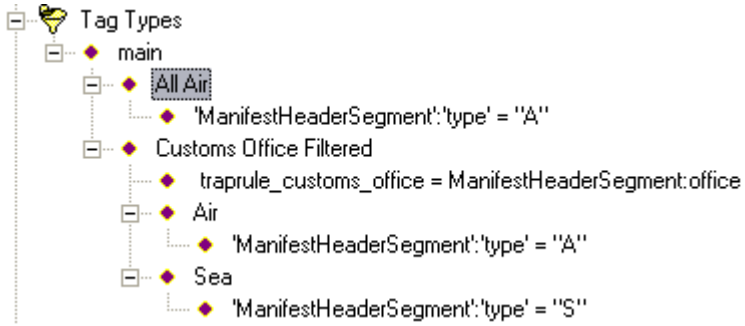
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



Select “Paste as Child” from the context menu of the “All Air”-element.



Hereafter the structure panel looks like this:



This completes the task. Now let us analyse what happens in various situations.

Let us image a user from customs office “1234” creates a trap rule and selects that the trap rule should apply to “Air”-declaration types only. In the expression view the user enters the rule:

ManifestLineOfPackages:decl_gross_weight > 1000

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

The final condition that is applied by the trap rule will be a combination of the rule entered by the user and the conditions defined for the selected leaf [Template Group] and all the conditions defined all the way to the top of the hierarchy. The rule will be:

((ManifestHeaderSegment:type = "A") AND
(traprule_customs_office = ManifestHeaderSegment:office)) AND
(ManifestLineOfPackages:decl_gross_weight > 1000)

Note that the sub-conditions are combined by the word "AND" which means that all of the conditions must be true before the trap rule fires, i.e.:

1) the declaration type must be "A" (Air manifest)
2) because the user who created the trap rule belongs to the customs office "1234" *traprule_customs_office* will be substituted by that value. For that reason only manifests for that office will make the sub-condition evaluate true.
3) Only manifest declarations having a gross weight greater than 1000 will be selected.

Overall we can say that the rule will fire for: Air-manifest for customs office 1234 having a declared gross weight greater than 1000.

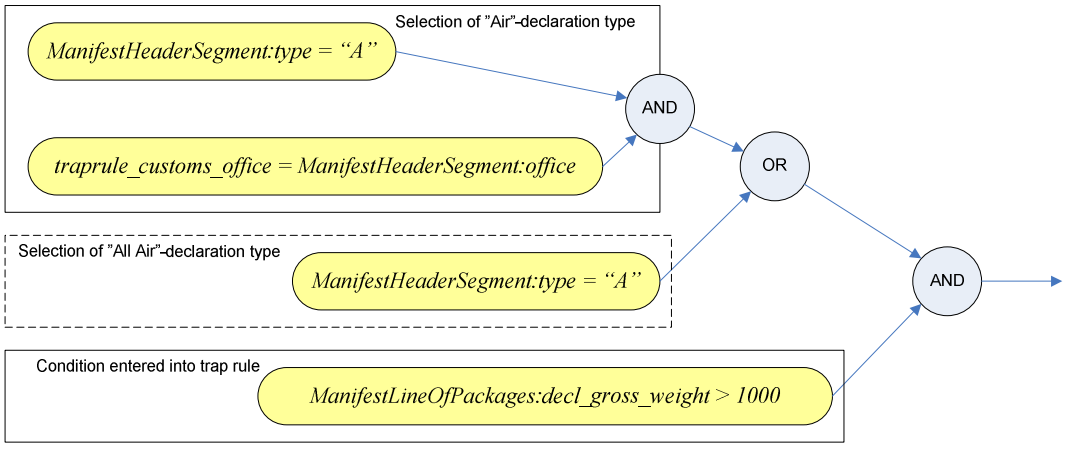
Let us image a user from customs office "1234" creates a trap rule and selects that the trap rule should apply to "Sea"-declaration types and "All Air"-declarations as well. In the expression view the user enters the rule:

ManifestLineOfPackages:decl_gross_weight > 1000

The final condition that is applied by the trap rule will be a combination of the rule entered by the user and the conditions defined for the selected leafs [Template Group] and all the conditions defined all the way to the top of the hierarchy. The rule will be:

((ManifestHeaderSegment:type = "A") AND
(traprule_customs_office = ManifestHeaderSegment:office) OR
(ManifestHeaderSegment:type = "A")) AND
(ManifestLineOfPackages:decl_gross_weight > 1000)

Note that the sub-conditions defined by multiple selection of declaration type are combined by the word "OR", which means that if one or more of the conditions evaluates true the expression evaluates true. The expression can look a little complex; however the figure below illustrates how the equation can be understood and how it is build up by the system.



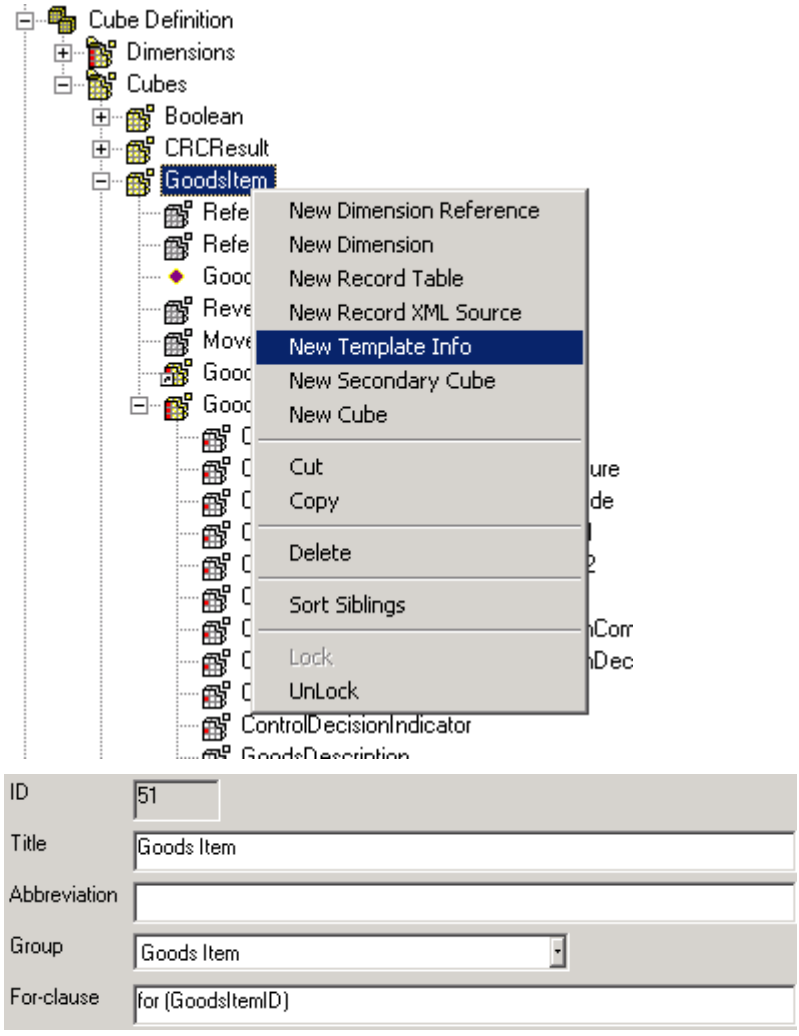
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

The first box illustrates the expression created because the trap rule was selected to be applied to “Air” declaration types. Because the “Air” node is located below two [Condition Code]-elements the conditions is combined by using AND.

The second box illustrates the expression created because the trap also was selected to be applied to “All Air” declaration types. Selecting multiple declaration types for a trap rule combines the expressions by an OR. Finally the expression entered into the trap rule is added by using AND.

2.9.3 Template Info for associating Template Groups and Cubes

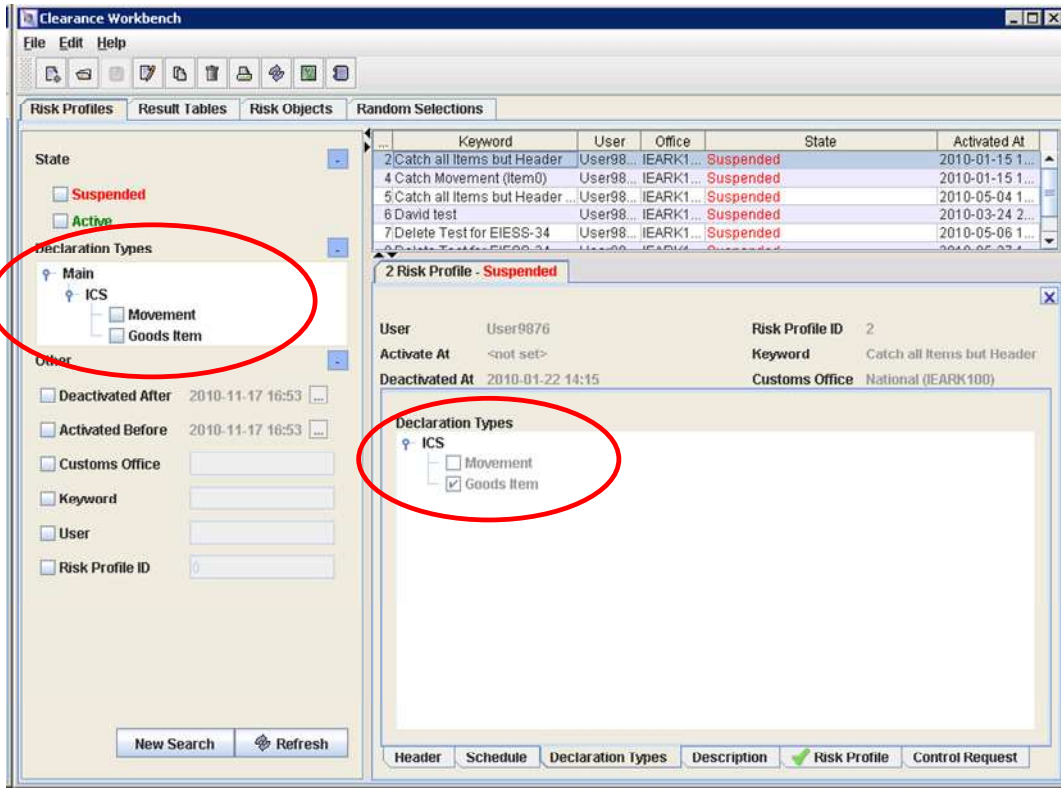
Basically a Risk Profile is a rule that iterates through all the members in a cube and for each member a condition is being tested. As described in the previous section the applied condition is the combination of the Template Group selected for the Risk Profile and the conditions made for the Risk Profile by using the ESKORT Clearance Workbench Application either directly in the *Formalized Expression View* or in the *Partial Expression View*. However to complete the rule in for a Risk Profile it must be defined on which cube the rule in the Risk Profile iterates as well as the dynamic dimensions over which it iterates. This is defined by adding a *Template Info*-element below the *Cube*-element in question.



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

The *Template Info*-element contains the following attributes:

- ID – an unique identifier, which is used internally by the system.
- Title – The name that will appear as declaration type in the ESKORT Clearance Workbench Application in the Risk Profile Search Filer and in the Risk Profile *Declaration Types*-tab.



- Abbreviation – This is attribute is usually not used, but can in some customized solution be used to support special features.
- Group – This is one of the *Template Group*-elements defined inside the *Tag Types*-element (see section 2.9). The conditions defined by the selected *Template Group*-element and the *Template Group*-elements above will be the condition for the rule made by the Risk Profile.
- For-clause – This is the for-clause (if any) that is used by the rule made by the Risk Profile.

Adding a *Template Info*-element as a child of a *Cube*-element hereby specifies the cube in which the rule made by a Risk Profile iterates (i.e. the Cube-element inside which the *Template Info*-element is inserted), the dynamic dimensions over which the rules iterates (i.e. the *For-clause*) and the conditions which together with the Risk Profile conditions defines the final condition of the Risk Profile rule.

2.10 Parameter table

In general the configuration of the ESKORT Clearance Risk Analysis System is stored in a database containing a number of tables. The ESKORT Designer provides the capability of

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

defining how the ESKORT Clearance Risk Analysis System is accessing and using the information in these tables during the risk analysis process. This is done by using Parameter Tables.
Parameter Tables provides the capability of:

1) Define new tables
2) Define how the contents of the tables is displayed in the ESKORT Clearance Workbench
3) Define how table data are accessed and updated during risk analysis process.

Each Parameter Table defines one or two database tables. In case the table data should be accessible in the ESKORT Clearance Workbench two tables are defined (one main-table and one log-table); otherwise only one table is defined. The reason for having two tables in a Parameter Table which data is accessible in the ESKORT Clearance Workbench is that all changes is done in main-table whereas all changes (revisions) is contained in a log-table. The columns contained in the main- and the log-table is equivalent to each other – the only difference between the two tables is the columns which defines the primary key.

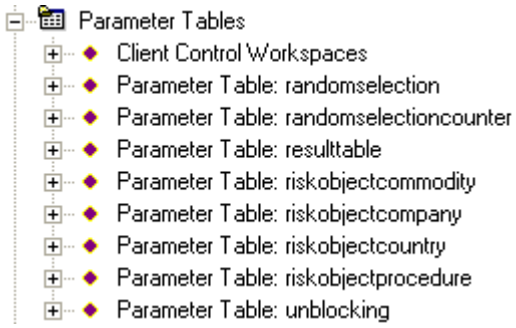
By using the ESKORT Designer it is possible to define the columns contained in the tables and to define which columns that should be used as key columns.
In case a Parameter Table is accessible from the ESKORT Clearance Workbench each columns can be associated with a graphic control that will be displayed in the ESKORT Clearance Workbench. The graphic control could be a text field, numeric field, drop down-list, etc.

The ESKORT Clearance Risk Analysis System accesses the Parameter Table by so-called Usages. A Usage is a named definition of one or more SQL queries that can be executed by function calls from the knowledgebase. The parameters for the SQL queries are also defined in the Usage as key-bindings which during risk analysis connect the parameters to specific fields on the declaration.

In the Parameter Tables element you can introduce changes of the configuration that, when published, will affect the behavior of the second and third phases of the risk analysis process. You can also alter interface of the corresponding parts of the ESKORT Clearance Workbench. During these two phases the risk analysis is performed using the parameters that are defined and updated in the ESKORT Clearance Workbench by officers in the customs offices in the country. Thus, in the second phase of the risk analysis risk scores are calculated for the customs declarations and they are then classified into risk groups for further action. During the third phase the selection of declarations is performed through random selections and for both phases there is an override mechanism to avoid inspections of goods declared by certain traders. For further information about the risk analysis process and the ESKORT Clearance Workbench refer to the ESKORT Clearance Workbench User Guide.

The child elements in the Parameter Tables element are the following in the ESKORT Clearance Risk Analysis Standard System:

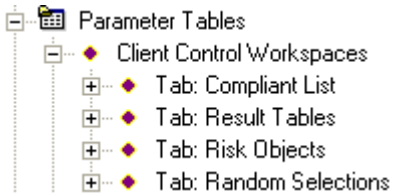
Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



Besides making changes to the existing configuration you can also create new Parameter Tables, e.g. the introduction of a new risk object type. New Parameter Table elements can be created by selecting New Parameter Table from the context menu.

2.10.1 Client Control Workspace

Using the client control workspaces element you can control the tabs in the Clearance Workbench and by opening the context menu and selecting New Tab you can introduce new tabs. In the ESKORT Clearance Risk Analysis Standard System there are following tabs:



2.10.1.1 Working with Tab Elements

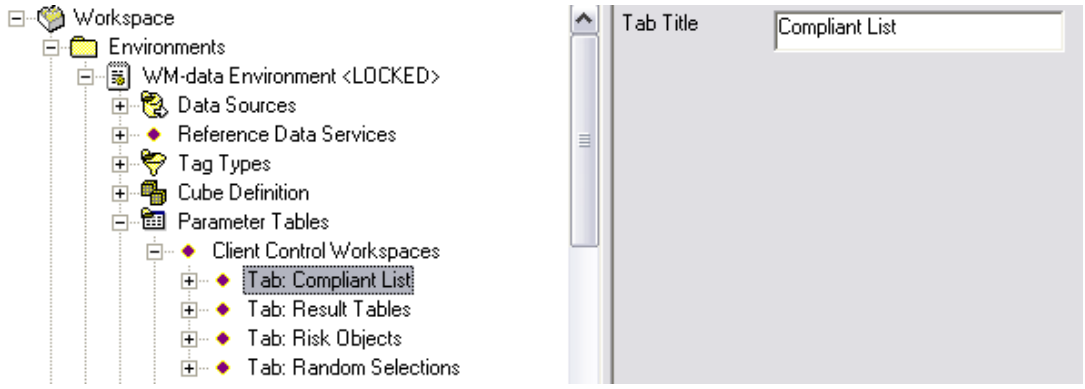
Each tab element can contain one or more Parameter Table child elements and each such child element associates the Parameter Tables with the tab element. This means enabling access of the relevant tab in the ESKORT Clearance Workbench to the functionalities specified in the Parameter Table.

Working with tab elements, meaning you have selected one of the tab elements in the structure pane, it is possible - via the context menu - to do the following:

- Change the Tab name
- Create a new tab
- Create a new Parameter Table
- Associate Parameter Tables
- Delete the selected tab element

In order to change the name you select the relevant tab element and then edit the name in the Tab Title text box in the editor pane. This illustrated in the picture below where the tab name is changed from Compliant List to My Compliant List.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



When you select to create a new tab, a new tab is inserted below the selected tab element and it contains one empty Parameter Table element.

If you select to create a new Parameter Table, a new Parameter Table element is inserted below the selected tab element.

In order to associate a Parameter Table to a tab element you first select the relevant Parameter Table element. You then select a Parameter Table from the Parameter Table drop down list in the editor pane. This list contains all the Parameter Tables that are defined in the system and each of these are found in the structure pane below the client control workspaces element. In the picture below the Parameter Table *riskobjectcommodity* has been selected as one of four Parameter Tables for the risk objects tab.

2.10.2 Working with Parameter Tables

In the ESKORT Clearance Risk Analysis system the long term, profound configuration work affecting phase 2 and 3 is executed via Parameter Tables in the ESKORT Designer as opposed to the daily configuration work that is carried out in the ESKORT Clearance Workbench. Depending on and conforming to the requirements from the business procedures new tables can be added, e.g. in order to enable the calculation of risk scores differently or adding a new risk object type.

2.10.2.1 Titles versus Names

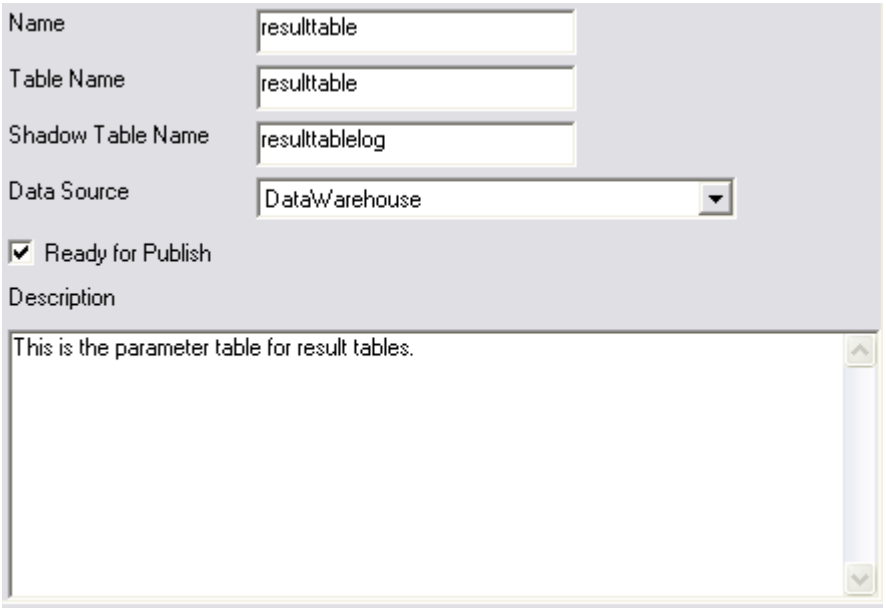
Working with Parameter Tables involves assigning titles and names for various entities in the system and this is done by keying in text strings into text boxes. Each of these text boxes has identification to the left of the box and it can either be Name or Title with or without a preceding string. It should be noted that the word “title” is reserved for text

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

strings that appear in the user interface of the ESKORT Clearance Workbench, e.g. as column or tab headers. The word “name” is reserved for system related entities such as e.g. Parameter Table names, table names and column names. When a name is entered it has to comply with the rules in the syntax language.

2.10.2.2 Creating and Editing Parameter Tables

To create a new Parameter Table you open the context menu and select the menu item New Parameter Table. The editor pane is automatically opened and you have to enter name for the Parameter Table in the Name text box. In the Table Name and Shadow Table Name text boxes you must enter the names from the database in the ESKORT Clearance Risk Analysis system. From the Data Source drop down list you then select the data source to be used and this should be one that is listed in the Data Sources document. By default the Ready for Publish tick box is ticked thereby allowing the Parameter Table to be included the next time you publish – if you un-tick the tick box it will be excluded. The Description text box can be used for documenting the new Parameter Table.
The picture below illustrates the Parameter Table for result tables in the ESKORT Clearance Risk Analysis Standard System.



When a new Parameter Table is created it will by default have one child element and this is a key column.

2.10.2.2.1 Parameter Tables Child Elements

A Parameter Table consists of a number of child elements each of which has one or more subordinate child elements. The child elements for a Parameter Table can be one or several of each of the following Parameter Tables element types – however at least one key-column must be defined:

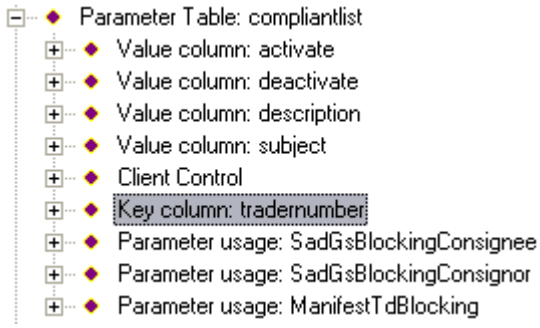
- Value column
- Key column
- Client control
- Parameter usage

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

When you are defining a Parameter Table the child elements can be created via the context menu.

By combining these element types you can define Parameter Tables that can perform specific risk analysis operations and at the same time govern the interface in the Clearance Workbench for the input of parameters used in the risk analysis process.

The picture below shows the Parameter Table for the compliant list in the ESKORT Clearance Risk Analysis Standard System and illustrates how the compliant list tab in the ESKORT Clearance Workbench is built up and also how the parameters are used in the risk analysis process.



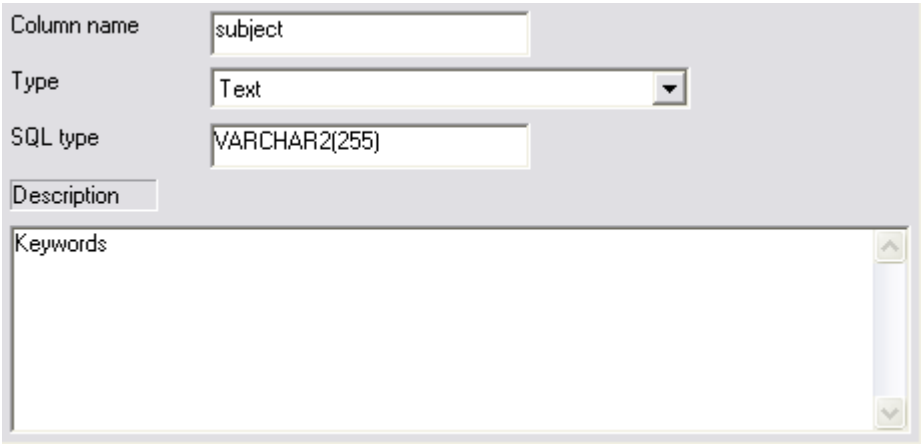
The value columns enable the usage of start and stop times, descriptions and keywords in the ESKORT Clearance Workbench and this is executed by assigning specific properties in subordinate elements. The client control element governs the access rights and the headers for the tabs in the data area in the ESKORT Clearance Workbench. The key columns define the trader number as a key field to be used in the risk analysis process as well as assigning specific properties for the ESKORT Clearance Workbench. The parameter usage elements specify exactly how value and key columns are to be used in the risk analysis process.

2.10.2.3 Value Columns

To create a new value column you open the context menu and select the menu item New Value Column. The editor pane is automatically opened and you have to enter a name for the value column in the Column name text box. From the Type drop down list you then select the data type. In the SQL text box you enter the database specific column type. The Description text box can be used for documenting the new Parameter Table.

The picture below illustrates the editor pane for the value column for keywords in the compliant list Parameter Table in the ESKORT Clearance Risk Analysis Standard System.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

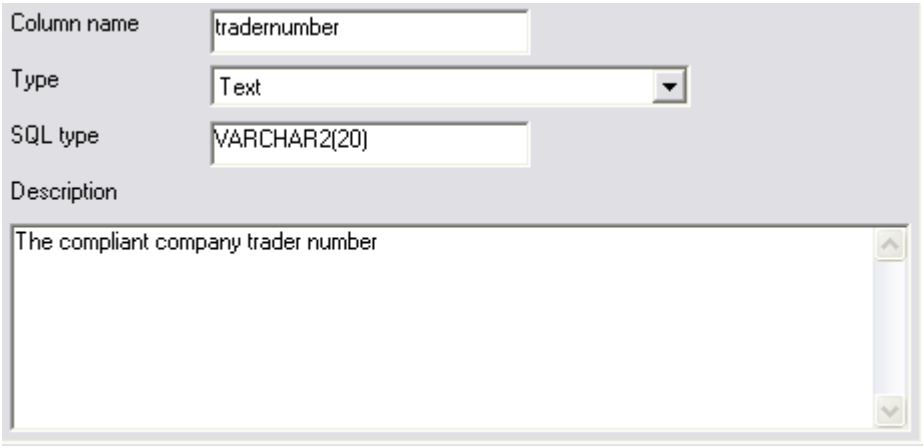


Value columns can only contain one child element, the client control element, which in turn can contain one or several child elements of different types. The client control element together with its subordinate elements defines the properties in the ESKORT Clearance Workbench and the usage in the risk analysis for each value column. For information on how to work with these elements refer to section 2.10.2.7.

2.10.2.4 Key Columns

To create a new key column you open the context menu and select the menu item New Key Column. The editor pane is automatically opened and you have to enter a name for the key column in the Column name text box. From the Type drop down list you then select the data type. In the SQL text box you enter the database specific column type. The Description text box can be used for documenting the new Parameter Table.

The picture below illustrates the editor pane for the key column for keywords in the compliant list Parameter Table in the ESKORT Clearance Risk Analysis Standard System.



Key columns can only contain one child element, the client control element which in turn can contain one or several child elements of different types. The client control element together with its subordinate elements defines the properties in the ESKORT Clearance Workbench and the usage in the risk analysis for each value column. For information on how to work with these elements refer to section 2.10.2.7.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.10.2.5 Client Control

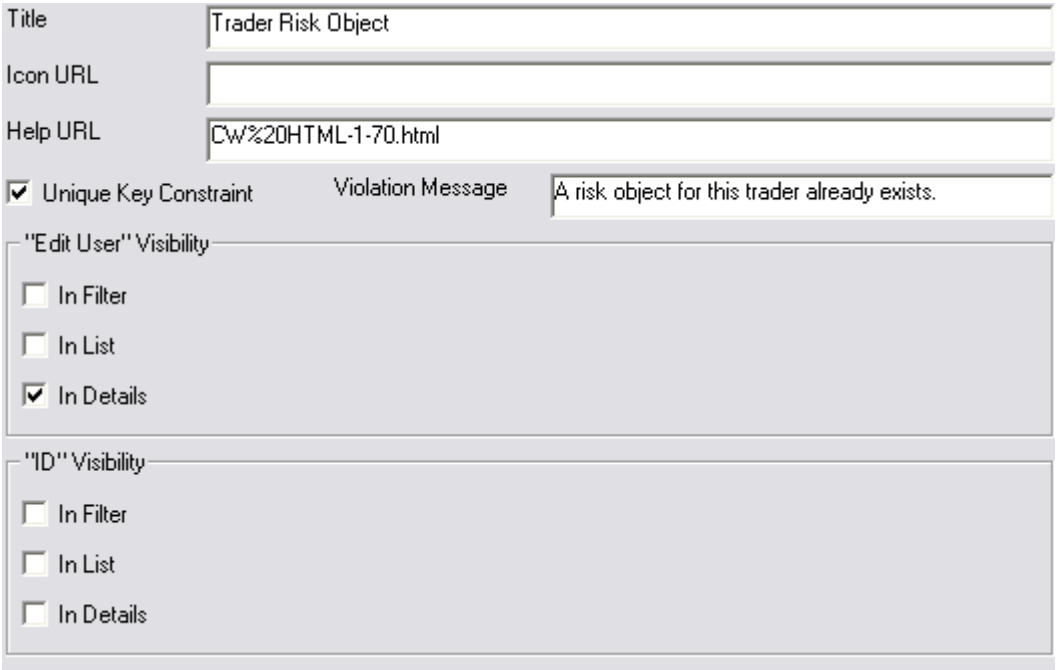
The client control element governs the access rights and the headers for the tabs in the data area in the ESKORT Clearance Workbench.

To create a client control element you open the context menu and select the menu item [New ClientControlParameterTable]. The editor pane is automatically opened and you have to enter a title in the Title text box. The Icon URL text box is planned for future use and has at present no impact on the system. In the Help URL it is possible to enter a link to a help text that can be opened in the ESKORT Clearance Workbench by pressing F1. By default the Unique Key Constraint is un-ticked and this has the effect that it is possible to create more than one instance of the key value in the ESKORT Clearance Workbench. This means that for e.g. the compliant list in the ESKORT Clearance Workbench it is possible to create more than one instance of the same trader number (which is the key column in the Designer). For the risk object trader number however it is not possible to have more than one instance and this is induced by having the unique key constraint tick box ticked (as in the picture below). If you have this box ticked you should enter a text in the Violation Message text box that informs the user of the violation when he/she tries to enter a key already stored in the database.

The “Edit User” Visibility and “id” Visibility areas can be used for governing the display of the user identity and the ID in the ESKORT Clearance Workbench. If the tick boxes are ticked it has the following effect in the ESKORT Clearance Workbench:

- In Filter – The user identity and the ID are displayed in the User filter criteria box in the Filter Area.
- In List – The user identity and the ID are displayed as columns in the Table Area.
- In Details – The user identity and the ID are displayed in each tab in the Data Area.

The picture below illustrates the editor pane for the client control element for the trader risk object Parameter Table in the ESKORT Clearance Risk Analysis Standard System.



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

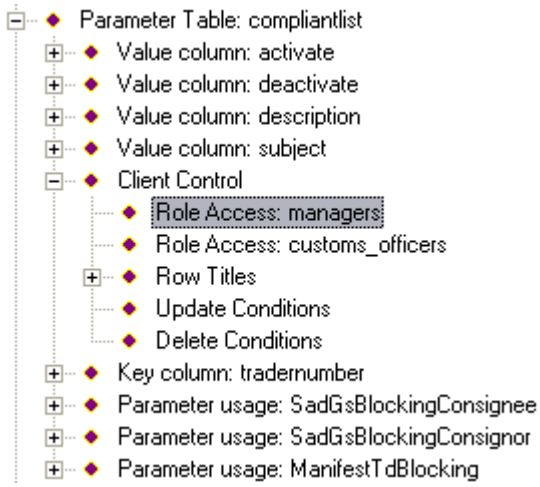
Each client control element can contain the following child elements:

- Role Access
- Row Titles
- Update Conditions
- Delete Conditions
- Hint

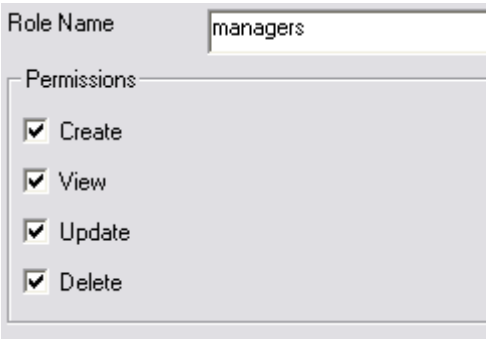
When you are defining a client control element the child elements can be created via the context menu.

2.10.2.5.1 Role Access

The role access element is used for assigning access rights to the users of the ESKORT Clearance Workbench according to their different roles and this has to be done for each Parameter Table. For each role you have to specify the access rights in separate role access elements meaning that if there are central, regional and local users the client control would contain three separate role access elements. In the ESKORT Clearance Risk Analysis Standard System there are two roles defined – managers and customs officers – as illustrated in the picture below.



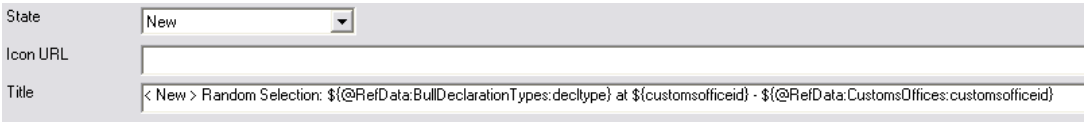
When you define role access you have to assign a role name and set permissions and this is done in the editor pane. The role name you key into the Role Name text box and the permissions are set by ticking a tick box for each permission. The picture below show the role access assigned for a manager role where all permissions are activated.



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.10.2.5.2 Row Titles

The row titles element is used for setting headers for the tabs in the Data Area of the ESKORT Clearance Workbench. From the context menu you select to create a New Row Title. From the State drop down list you select the state (see section 2.10.2.8) and you then enter the title in the Title text box. It is possible to include a link to a value as can be seen in the picture below.

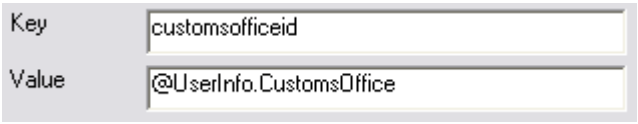


The Icon URL text box is planned for future use and has at present no impact on the system.

2.10.2.5.3 Update Conditions

Update conditions can be defined in order to further restrict the access rights given in the role access element to update parameters in the ESKORT Clearance Workbench. Thus in the ESKORT Clearance Risk Analysis Standard System for random selection customs officers are restricted to update only configuration elements in the ESKORT Clearance Workbench that exist for the customs office to which the officer belongs.

To create an update condition you select [New CciDocumentContextCondition] from the context menu. In the Key text box you enter the key column to be used for the restriction and in the Value text box the link to the value, see example below.



2.10.2.5.4 Delete Conditions

Delete conditions elements are used the same way as update conditions, see section 2.10.2.5.3, but only affects the possibilities to delete parameters in the ESKORT Clearance Workbench.

2.10.2.5.5 Hint

The hint element is planned for future use and has at present no impact on the system.

2.10.2.6 Parameter Usage

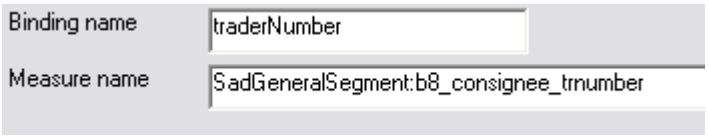
The parameter usage elements are used for specifying how the parameters in the Parameter Table should be used in the risk analysis process.

To create a parameter usage element you open the context menu and select the menu item New Parameter Usage. The editor pane is automatically opened and you have to enter a name for the parameter usage element in the Usage name text box. When you create a new parameter usage element a child element called [SQLParameterUsageSqlStatement] is automatically created. The SQL statement to be used can either be typed into the child element or into the parent element.

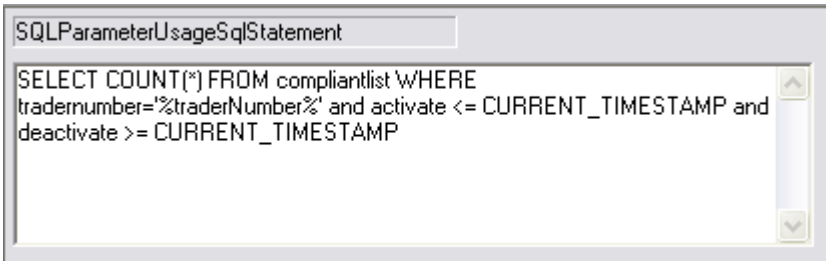
If the SQL statement is referring to a key column you have to define a key binding element and this is created from the context menu. In the editor pane you enter a name in the Binding name text box and in order to link this to the relevant measure in a cube you must

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

enter the measure name in the Measure name text box. In the picture below the binding name *traderNumber* is linked to the SAD box 8 measure in the SAD general segment cube.



The binding name can now be used in the SQL statement as is illustrated in the picture below.



2.10.2.7 Client Control for Value and Key Columns

The client control for value and key columns are used for defining the interface in the ESKORT Clearance Workbench for each value and key column in the Parameter Tables, which means that you can e.g. assign properties for filter, table and data areas in the ESKORT Clearance Workbench.

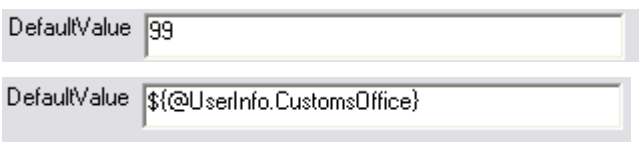
To create a client control element you open the context menu and select the menu item [New ClientControlParameterColumn]. The editor pane is automatically opened and it contains a Preserve on Copy tick box which is ticked by default meaning that when a user of the ESKORT Clearance Workbench performs a duplicate operation, whereby an existing configuration element is duplicated into a new configuration element and the contents of the existing element is copied into the new element. If you remove the tick the new, duplicated element will be a default value – usually empty.

From the context menu it is now possible to create the following child elements:

- Default value
- Search filters
- Columns
- Editors
- Constraints

2.10.2.7.1 Default Value

If a column needs a default value this can be defined by selecting New Default Value from the context menu. In the [DefaultValue] text box in the editor pane you enter the value to be used. In the examples below you will find default values for random selection interval size and customs office ID.



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

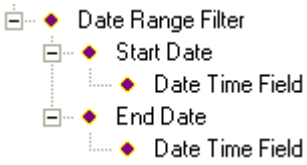
2.10.2.7.2 Search Filters

Search filters are used for defining the search conditions in the filter area of the ESKORT Clearance Workbench which are used for filtering the contents of the table area. From the context menu you can select five different search filters:

- Date range filter
- Number filter
- Numeric range filter
- Set filter
- Text filter

2.10.2.7.2.1 Date Range Filter

When you make a new date range filter the following elements are automatically created:



For the date range filter element you have to enter a reference in the Interval End Column Reference text box which is a link to the column to be used for ending the interval. In the [Start Later Than End Message] text box you can write an alert message to the user. The message will be displayed in case the end date entered by the user lies before the start date entered by the user.

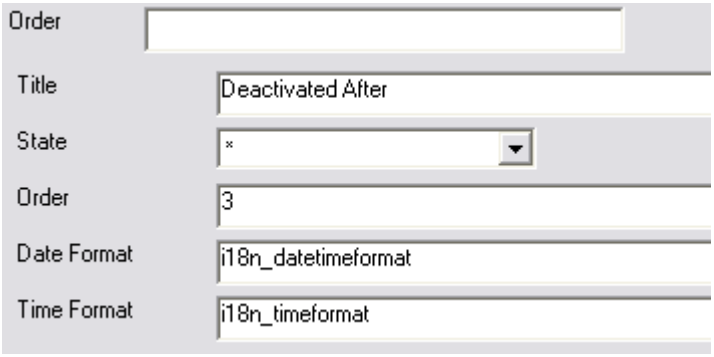
By default the Optional tick box is ticked meaning that the tick box in the ESKORT Clearance Workbench for activating the search condition is present. If the optional tick box is un-ticked the filter component will always be used during the search.

For the start date element you have the option to enter a value in the Order text box and this governs the display order of the search condition in the ESKORT Clearance Workbench starting from the top of the Filter Area. If you leave this box empty the sorting will be done alphabetically. The rest of the contents in the editor pane you can either complete it in the start date or the date time field elements. For detailed information about date time fields (see section 2.10.2.7.5.1.1).

The end date element and its child element is completed in the same way as the start date element, the only difference being the title which should reflect the end date in the ESKORT Clearance Workbench and the order.

The picture below illustrates the editor pane for the start date element in the compliant list Parameter Table.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



For date time field elements you can define three types of constraints from the context menu. It is thus possible to select to make a New Not NULL Constraint. For detailed information about the not null constraint see section 2.10.2.7.5.2.1. The other two possible constraints are the Date Later Than [Field] and Date Later Than "Now" constraints, see sections 2.10.2.7.5.2.7 and 2.10.2.7.5.2.8.

2.10.2.7.2.2 Number Filter

When you define a number filter you have to select an operator from the drop down list in the editor pane for the number filter element.

By default the Optional tick box is ticked meaning that the tick box in the ESKORT Clearance Workbench for activating the search condition is present. If the optional tick box is un-ticked the filter component will always be used during the search.

Number filters have one child element and this is the number field, for detailed information see 2.10.2.7.5.1.4.

It is possible to, via the context menu, to define minimum and maximum constraints in order to restrict the filter to intervals. For detailed information about the Min/Max Value constraint see 2.10.2.7.5.2.6.

2.10.2.7.2.3 Numeric Range Filter

Numeric range filters are used for define search conditions in the form of numeric intervals such as in the Result Tables tab in the ESKORT Clearance Workbench. For the numeric range filter element there is only one item to address and this is the optional tick box. By default the Optional tick box is ticked meaning that the tick box in the ESKORT Clearance Workbench for activating the search condition is present. If the optional tick box is un-ticked the filter component will always be used during the search.

The numeric range filter element has one child element, the numeric range field and this is created automatically as you create the filter. For detailed information about numeric range fields see section 2.10.2.7.5.1.5.

You can define minimum and maximum constraints in order to restrict the filter to intervals. For detailed information about the Min/Max Value constraint see section 2.10.2.7.5.2.6.

2.10.2.7.2.4 Set Filter

The search filter type Set Filter is used for defining a set of tick boxes with associated values that the user can tick in order to include them as search conditions. This is done in the ESKORT Clearance Workbench for filtering risk values in the Risk Objects tab.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

When you select to create a New Set Filter from the context menu a set filter element is inserted in the structure pane. You then select to make a New Multi Select Field from the context menu and together with this new element a reference data set child element is created. For detailed information about multi select fields see section 2.10.2.7.5.1.2.

It is possible, via the context menu, to define not null constraints. For detailed information about the not null constraint see section 2.10.2.7.5.2.1.

2.10.2.7.2.5 Text Filter

Text filters can be used to enable searching for text strings when working in the ESKORT Clearance Workbench. When you select to create a New Text Filter from the context menu a text filter element is inserted in the structure pane. In the editor pane you have to indicate whether the filter shall be optional or not by ticking/un-ticking the Optional tick box. You then open the Operator drop down list and select the operator to be used for text search.

When you are creating text filters you can define one instance each of the child elements text field and drop down list and this is done from the context menu.

For detailed information about text fields see section 2.10.2.7.5.1.7.

When defining text fields you can induce the following constraints:

- Not null – see section 2.10.2.7.5.2.1
- Not empty string – see section 2.10.2.7.5.2.2
- Max string length – see section 2.10.2.7.5.2.3
- String contents – see section 2.10.2.7.5.2.4
- Code – see section 2.10.2.7.5.2.5

For detailed information about drop down lists see section 2.10.2.7.5.1.2.

For drop down lists you can attach not null constraints, see section 2.10.2.7.5.2.1.

2.10.2.7.3 Columns

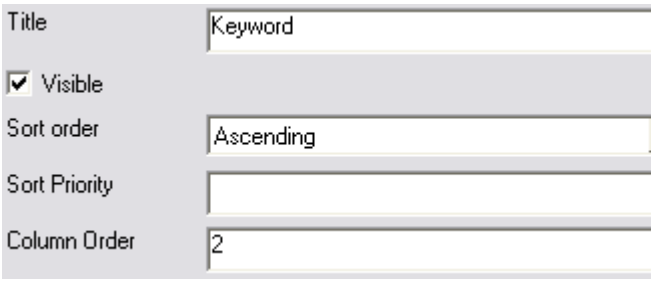
The columns elements are used for defining the appearance of the table area in the ESKORT Clearance Workbench and this means that you can govern the order of the columns sort order etc.

For columns elements you can only create list view column elements and this is done from the context menu. In the editor pane for list view columns you enter a title in the Title text box and this will then be displayed as a column header in the ESKORT Clearance Workbench. The Visible tick box is used for displaying or hiding columns in the ESKORT Clearance Workbench and it is ticked by default in the visible element meaning that the column will be displayed when you start the ESKORT Clearance Workbench, if you wish to have the column hidden you un-tick the tick box. You then open the Sort order drop down list and select the method for sorting the data in the column in the ESKORT Clearance Workbench. Optionally you can also enter a Sort Priority to be used as primary, secondary etc. sort keys. You finally enter a number in the Column Order text box and this governs horizontal order of the column in the table area of the ESKORT Clearance Workbench. When the ESKORT Clearance Workbench renders the columns in the list view the column having the lowest column order will be displayed as the left most columns, the column with the second lowest column order will be displayed as the next left most column, etc.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

For list view columns you can create a reference data set child element. A reference data set element is used for linking the filter to reference data defined in the Reference Data Services document at the top of the structure pane. In the ID text box you enter the name of the data set defined in the Reference Data Services document. The Item Pattern text box is used for defining the pattern of the data set. For the reference data set elements you can also create column sort order child elements in order to sort the contents of the drop down lists. In the Name text box you enter the name of the column to be used and in the Sort order drop down box you select the sort order to active.

The picture below shows the list view column contents for the keyword value column.



2.10.2.7.4 Editors

Editor elements are used for controlling data entry in the ESKORT Clearance Workbench such as e.g. keywords, codes and dates. This means that for each value column you define the ESKORT Clearance Workbench user interface for creation and update of configuration elements.

From the editors element you can create a number of different fields and they are listed below. Detailed information on how to work with each of them is found in respective sections.

- Section 2.10.2.7.5.1.1 Date Time Fields
- Section 2.10.2.7.5.1.2 Drop Down Lists and Multi Select Fields
- Section 2.10.2.7.5.1.3 Note Fields
- Section 2.10.2.7.5.1.4 Number Fields
- Section 2.10.2.7.5.1.5 Numeric Range Fields
- Section 2.10.2.7.5.1.6 Result Table Fields
- Section 2.10.2.7.5.1.7 Text Fields

2.10.2.7.5 Common Elements

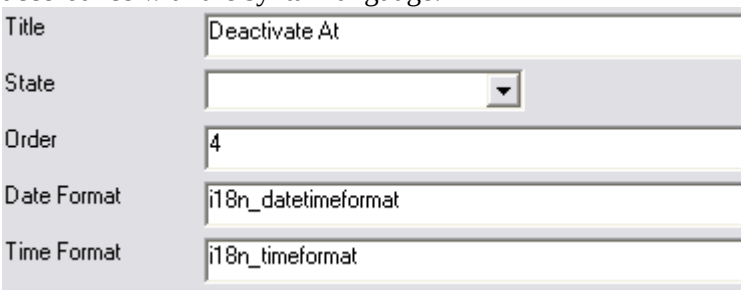
Some of the elements in the Designer are common elements that can be used repeatedly and occurs in different parts of the Parameter Table. Examples of such common elements are text fields, number fields, not null constraints and string contents constraints. In the following section these are described.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.10.2.7.5.1 Fields

2.10.2.7.5.1.1 Date Time Fields

Enter a text in the Title text box that you wish to be displayed as title in the ESKORT Clearance Workbench and open the State drop down list and select for what state/states (see section 2.10.2.8) the date should apply. The order indicated in the Order text box will indicate the order in the ESKORT Clearance Workbench for the field starting from the top of the relevant display. Finish the date time field by entering the date and time formats in accordance with the syntax language.



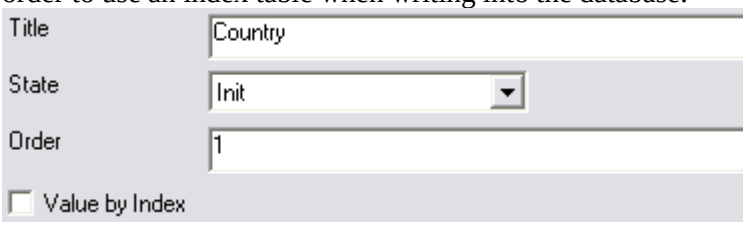
For date time fields the following constraints can be defined:

- Not NULL – refer to section 2.10.2.7.5.2.1
- Date Later Than [Field] – refer to section 2.10.2.7.5.2.7
- Date Later Than "Now" – refer to section 2.10.2.7.5.2.8

The i18n_datetimeformat and i18n_timeformat are names of formats defined in a resource bundle elsewhere in the ESKORT Clearance Risk Analysis System. If you would like to define your own format you can write the formatting text in the fields. Please refer to the SimpleDateFormat class documentation in http://java.sun.com/j2se/1.4.2/docs/api/.

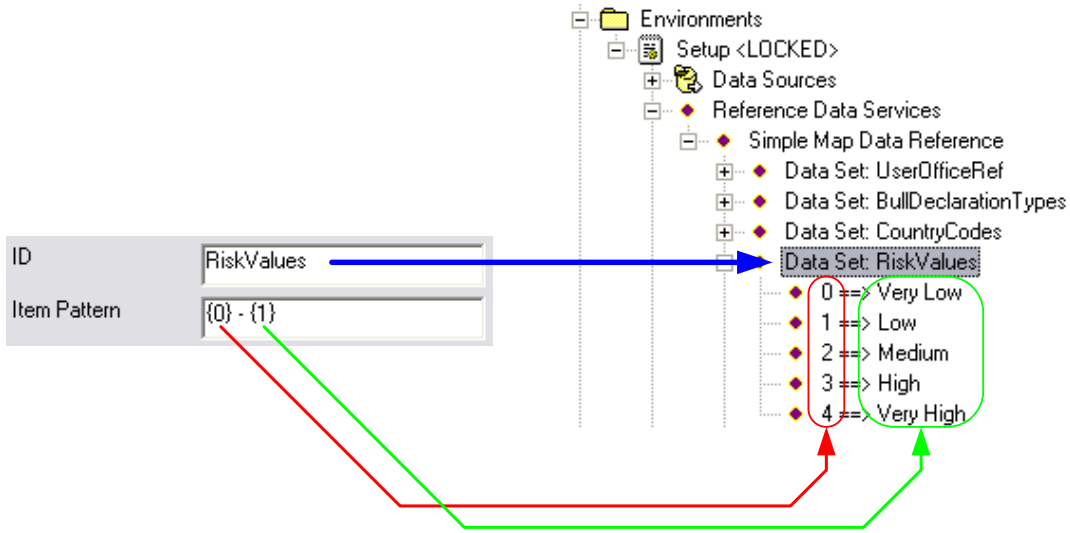
2.10.2.7.5.1.2 Drop Down Lists and Multi Select Fields

Enter a title in the Title text box that you wish to be displayed as title in the ESKORT Clearance Workbench and open the State drop down list to select for what state/states, see section 2.10.2.8, the date should apply. The order indicated in the Order text box will rule the display order in the ESKORT Clearance Workbench. The value by index can be used in order to use an index table when writing into the database.



Drop down list and multi select field elements always contains a reference data set child element and this is used for linking to reference data defined in the Reference Data Services document at the top of the structure pane. In the ID text box you enter the name of the data set defined in the Reference Data Services document. The Item Pattern text box is used for defining the pattern of the data set. In the following three pictures, where the last one is from the ESKORT Clearance Workbench, illustrates the linking. The ID *RiskValues* is linked to the data set *RiskValues* and the pattern {0} – {1} reflects the risk values as digits and texts, where the first part of the pattern is the digits and the second part is the texts. The last picture shows the resulting filter in the ESKORT Clearance Workbench.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



It is possible to create column sort order child elements in order to sort the contents of the drop down lists. In the Name text box you enter the name of the column to be used and in the Sort order drop down box you select the sort order to active.

For drop down lists and multi select fields the following constraint can be defined:

- Not NULL – refer to section 2.10.2.7.5.2.1

2.10.2.7.5.1.3 Note Fields

Enter a title in the [CcitTitle] text box that you wish to be displayed as title in the ESKORT Clearance Workbench and open the State drop down list to select for what state/states, see section 1.2.8, the date should apply. The order indicated in the Order text box will rule the display order in the ESKORT Clearance Workbench. The value by index can be used in order to use an index table when writing into the database.

For note fields the following constraints can be defined:

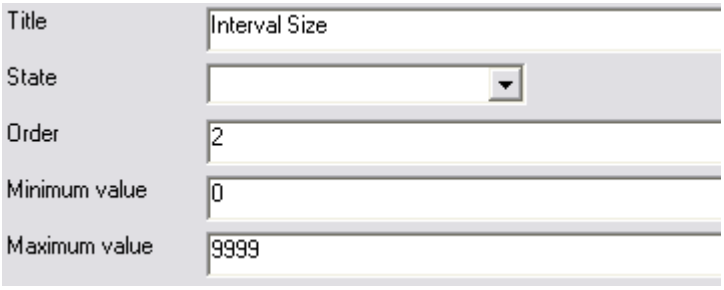
- Not NULL – refer to section 1.2.7.5.2.1
- Not Empty String - refer to section 1.2.7.5.2.2
- Max String Length - refer to section 1.2.7.5.2.3
- String Contents - refer to section 1.2.7.5.2.4

2.10.2.7.5.1.4 Number Fields

Enter a title in the Title text box that you wish to be displayed as title in the ESKORT Clearance Workbench and open the State drop down list to select for what state/states (see

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

section 2.10.2.8 States), the date field should apply. The order indicated in the Order text box will rule the display order in the ESKORT Clearance Workbench. Finally you enter the minimum and maximum values to be used.

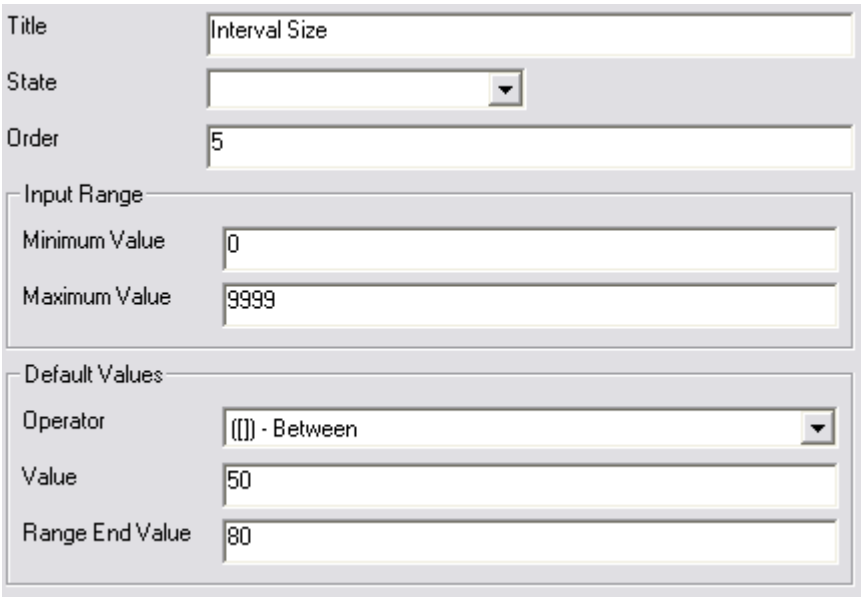


For number fields the following constraints can be defined:

- Not NULL – refer to section 1.2.7.5.2.1
- Min/Max Value – refer to section 2.10.2.7.5.2.6

2.10.2.7.5.1.5 Numeric Range Fields

Enter a title in the Title text box that you wish to be displayed as title in the ESKORT Clearance Workbench and open the State drop down list to select for what state/states (see section 2.10.2.8), the date field should apply. The order indicated in the Order text box will rule the display order in the ESKORT Clearance Workbench. In the Input Range area you set the minimum and maximum values that should apply. If you wish to use default values you first open the Operator drop down list and select the operator that shall be displayed by default in the ESKORT Clearance Workbench. You the enter values in the Value and Range End Value text boxes to used as default interval in the ESKORT Clearance Workbench.



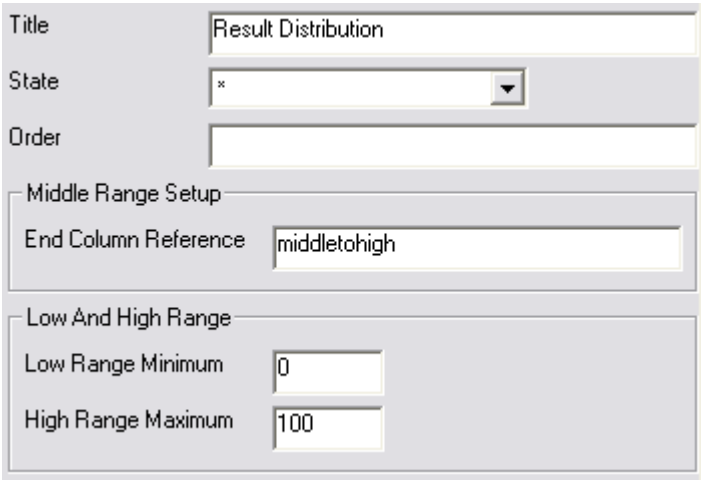
For numeric range fields the following constraints can be defined:

- Not NULL – refer to section 1.2.7.5.2.1
- Min/Max Value – refer to section 2.10.2.7.5.2.6

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.10.2.7.5.1.6 Result Table Fields

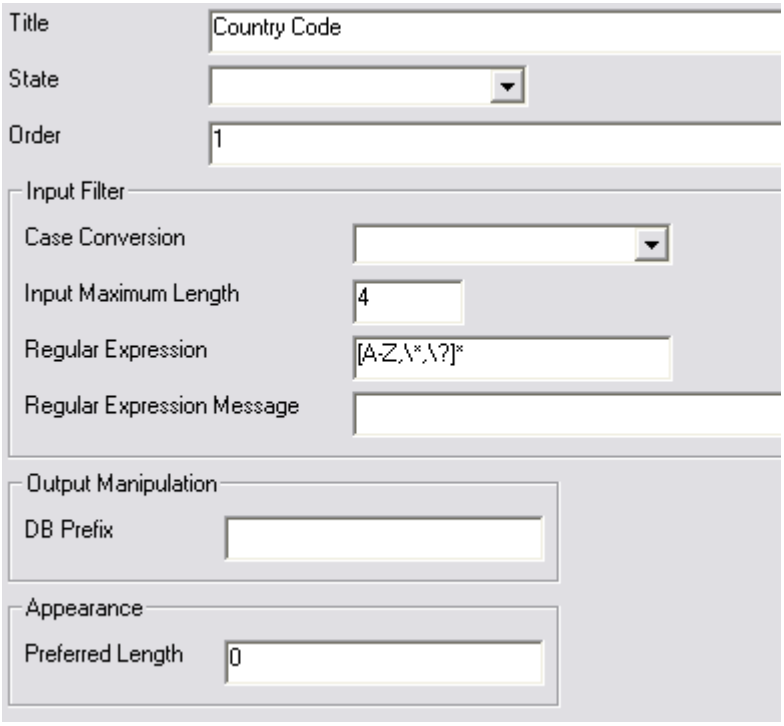
Enter a title in the Title text box that you wish to be displayed as title in the ESKORT Clearance Workbench and open the State drop down list to select for what state/states (see section 2.10.2.8), the date field should apply. The order indicated in the Order text box will the display order in the ESKORT Clearance Workbench. In the middle range setup area enter a reference in the End Column Reference text box to indicate the relevant value column to be used. Finally enter the low and high range values in the Low Range Minimum and High Range Maximum text boxes.



2.10.2.7.5.1.7 Text Fields

Enter a title in the Title text box that you wish to be displayed as title in the ESKORT Clearance Workbench and open the State drop down list to select for what state/states (see section 2.10.2.8), the date should apply. The order indicated in the Order text box will the display order in the ESKORT Clearance Workbench. In the Input Filter area of the editor pane you optionally select case conversion from the Case Conversion drop down list, set the length of the search string in the Input Maximum Length text box, and enter the format (what characters are allowed for use) in the Regular Expression text box. The Regular Expression Message text box is planned for future use and has at present no impact on the system. Finally you optionally enter DB Prefix that will be stored in the database together with the user input (e.g. a leading zero for trader numbers) and Preferred length that will set a fixed length to box in the ESKORT Clearance Workbench.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence



For text fields the following constraints can be defined:

- Not NULL – refer to section 1.2.7.5.2.1
- Not Empty String - refer to section 2.10.2.7.5.2.2
- Max String Length - refer to section 2.10.2.7.5.2.3
- String Contents - refer to section 2.10.2.7.5.2.4
- Code – refer to section 2.10.2.7.5.2.5

2.10.2.7.5.2 Constraints

When the user through the ESKORT Clearance Workbench enters new values or modifies existing values the ESKORT Clearance Workbench verifies that the values constitute valid values. This is controlled by adding constraints to the fields that are checked when the user creates a new configuration element, i.e. when the user has entered the key-values and clicks the [Next]-button and when the user saves the final configuration element either for completing a new configuration element or to update an existing.
This section describes the different constraints that can be defined by using the ESKORT Designer.

2.10.2.7.5.2.1 Not NULL

The not null constraint is used for making it mandatory to enter values meaning that the user must key in a value in a field. To define not null constraints you select state/states (see section 2.10.2.8), from the State drop down list and in the Simple Message text box enter a message to inform the user that he must supply a value.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.10.2.7.5.2.2 Not Empty String

The not empty constraint is used for making it mandatory to enter values meaning that the user must key in a value in a field. To define not empty constraints you select state/states (see section 2.10.2.8), from the State drop down list and in the Simple Message text box enter a message to inform the user that he must supply a value.

2.10.2.7.5.2.3 Max String Length

The max string length constraint is used for limiting the length f text strings. To define max string length constraints you select state/states (see section 2.10.2.8), from the State drop down list and in the Simple Message text box enter a message to inform the user. In the Max Length text box you then enter the maximum length value.

2.10.2.7.5.2.4 String Contents

The string content constraint is used for formatting text strings. To define string contents constraints you select state/states (see section 2.10.2.8), from the State drop down list and in the Simple Message text box enter a message to inform the user. In the Regular Expression text box you enter regular expression against which the entered text is validated, i.e. the text entered into the text field by the use of ESKORT Clearance Workbench is compared with the regular expression defined in the ESKORT Designer. In case the regular expression matches the entered text the constraint is fulfilled; otherwise the message will be displayed. As long as the entered text does not match the defined regular expression and the user will be unable to continue the operation.

2.10.2.7.5.2.5 Code

Using the code constraint it is possible to induce a validity check when the user is entering data in the ESKORT Clearance Workbench, e.g. checking the correctness of commodity codes.

To define code constraints you select state/states (see section 2.10.2.8), from the State drop down list and in the Simple Message text box enter a message to inform the user. In the Target Service text box you enter the link to the reference data in the Reference Data Services document.

2.10.2.7.5.2.6 Min/Max Value

The minimum and maximum constraint is used in order to restrict entering of values to certain intervals. To define min/max value constraints you select state/states (see section 2.10.2.8), from the State drop down list and in the Simple Message text box enter a message to inform the user that he must supply a value. To make the constraint complete you enter minimum and maximum values to be used.

2.10.2.7.5.2.7 Date Later Than [Field]

The date later than [field] constraint can be used for comparing a date/time field with a link to another date/time field in the system. To define such constraints you select state/states (see section 2.10.2.8), from the State drop down list and in the Simple Message text box enter a message to inform the user. In the Comparison Field box you define the link to the field that shall be compared.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.10.2.7.5.2.8 Date Later Than "Now"

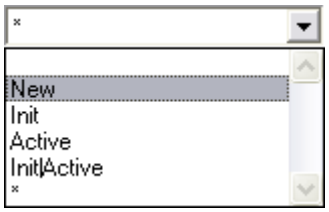
When a user of ESKORT Clearance Workbench tries to save a configuration element there might be date/times that are set to activated before the time that he/she clicks the save button. The date later than "now" constraint can be used to allow saving date/times that are in the past.

To define such constraints you select state/states (see section 2.10.2.8), from the State drop down list and in the Simple Message text box enter a message to inform the user. In the Tolerance (sec.) box you enter a value in seconds that shall apply.

2.10.2.8 States

In the ESKORT Clearance Workbench a configuration element can exist in three different states, Init, New and Active. When you create a new element you are prompted for an initial value, e.g. the commodity code for a new commodity risk object. Once the initial value is entered you can use the next button to proceed to the next configuration step. Up until you click the next button the element is in the Init state and it is then moved to the New state. In this state you enter the required data for the element and when finished you click the save button. As you do so the element is transferred into the Active state which means the configuration element will be used by the risk analysis process.

When you select state from the state drop down list in the Designer you can either select one of the three states or a combination of states. As shown in the picture below it is possible to select both Init and Active by selecting Init/Active or all three states by selecting the asterisk.



Please note that depending in the context the state-attribute has some or none relevance.

2.11 Libraries

The [Libraries] element can be used to specify class names of external COM objects, which should be referenced by the Analysis Server. External COM objects may contain so-called user functions that can be called from rules.

The default COM object provided is contained in the standard file BasicComFunctions.DLL. Your COM library could be different named (in some installations, the name Emil2.dll is used).

To add this file, make the [Libraries] element the current element and select [New Library] from the context menu.

This will result in a new library to be inserted.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Enter 'BasicComFunctions.class' (or whatever name your COM library has) in the editor pane.

Note that COM is only available on Windows platforms.

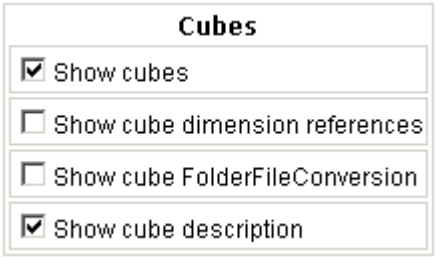
2.12 Generic Report for Environments

The generic reports allow you to choose what to show after you have opened the report.

The generic report for environments allows information on cubes, dimensions, parameters and extract definitions to be reported. The report is activated through [Report: Generic] on the context menu for environments.

2.12.1 Selecting Information

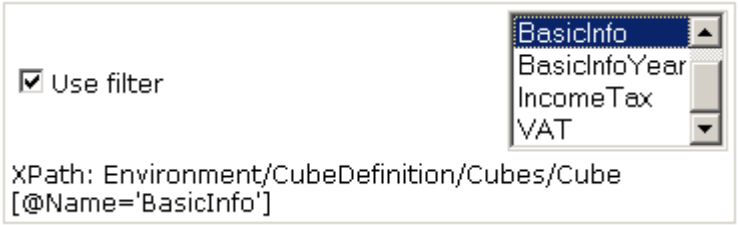
You can select the information you want to include in the report by checking the text boxes marked [Show <*information*>]. In the following example, the report has been configured to show cubes and the cube descriptions.



2.12.2 Filtering

You can filter the report (e.g. only show information for selected cubes), by using one or more of the filters on the right. The [Use Filter] check box indicates whether the filter is active, while the listbox to the left shows all possible values (e.g. all cube names).

When the [Use Filter] checkbox is checked, the report will only show information on objects with the value(s) selected in the listbox. In the following example, the report has been configured to only show information for the BasicInfo cube.



To disable the filter, uncheck the filter checkbox.

Note, that you can select several cubes by holding down the Ctrl key while clicking the cube names.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2.12.3 Hiding or Showing the Controls.

The

button allows the controls to be hidden – and showed again. Click this to leave more room for the actual report contents.

2.12.4 Other Features

The generic report supports the following additional features:

- Refresh – Clicking [Refresh] forces the report to be refreshed, so that the contents reflect the control settings.
- Auto Refresh – By default, the report is updated every time you change a setting (e.g. change the selection in a filter listbox). For very large reports, it can take some time to update the report. You can turn of the automatic refresh by un-checking [Auto Refresh]. The report will then only be refreshed when you click [Refresh].
- Reset – Clicking [Reset] resets the contents off all controls.
- Help – Shows a short help text with tips for using the report. The help text can be hidden again by clicking [Help] again.

2.12.5 Example

To show information about the BasicInfo cube – including the dimension references and descriptions, complete the following steps:

1. Click the [Show cubes] checkbox.
2. Click the [Show cube dimension references] checkbox.
3. Click the [Show cube description] checkbox.
4. Click the [Use filter] checkbox.
5. Click BasicInfo in the listbox.
6. Click [Hide/Show Controls] – to hide the controls.

The report is now showing the requested information about the BasicInfo cube.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

3. Environment Verification

3.1 Introduction

Creating and maintaining environments is an important task. No risk analysis can be conducted if the environments the knowledge bases rely on contain errors. This chapter discusses how to verify environments for correctness as well as how to solve a number of common problems.

Note that this section mainly deals with verifying the syntax of the environment. Problems in the semantics (e.g. extraction and conversion based on incorrect date fields) are usually more difficult to detect. Those problems will most often become apparent when the environment is used by the knowledge engineers during rule development and rule testing.

3.2 Environment Verification

3.2.1 General Verification

In general many inconsistencies may be detected using the verify option, which is available for the various document types.

Refer to [ESKORT Designer, Section I – Introduction] for more information.

It is suggested to perform this verification prior to the verification procedures described in the next sections.

3.2.2 Verification of Extract Definition

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Appendix A: Menu-items, Buttons and Shortcuts

This appendix defines the menu-items, buttons and shortcuts in the GUI.

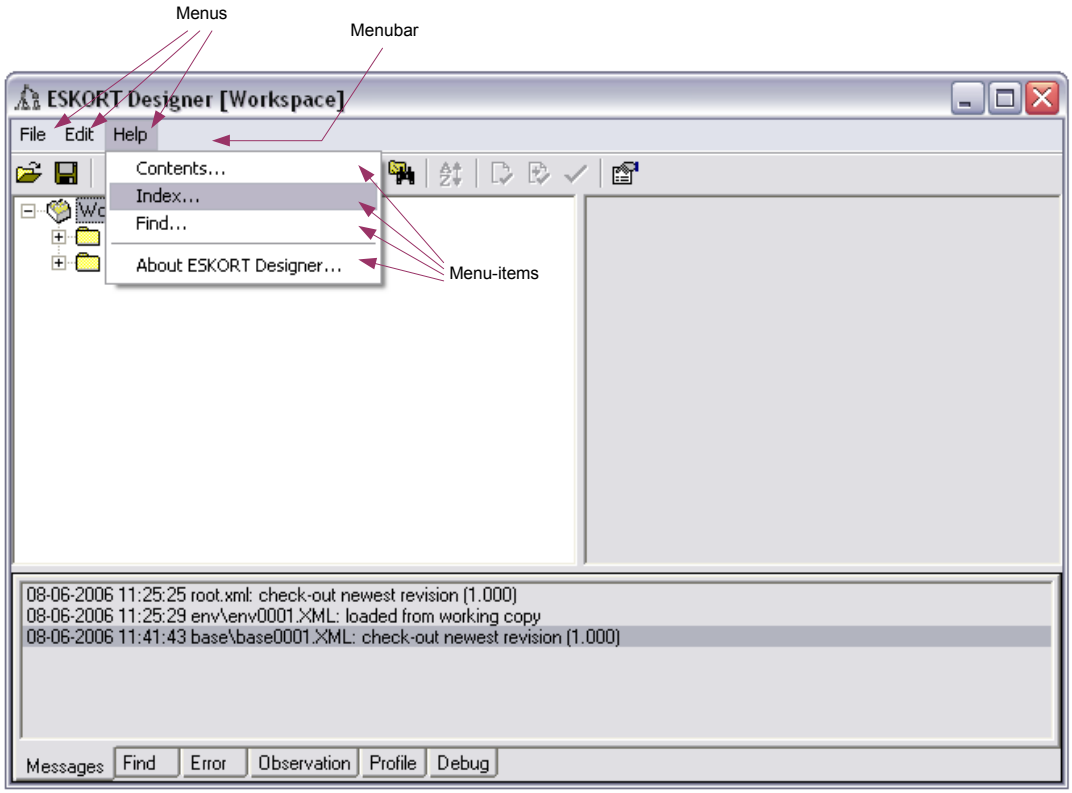
Menu-items

Typically Windows Application contains a menu-bar located at the top of the application window just below the title bar. This is also the implemented in the ESKORT Designer. The menu-bar contains a number of menus and menu-items structured in a hierarchically form.

A menu contains an arbitrary number of sub-menus and menu-items. If the user selects a menu the contained sub-menus and menu-items will be visible on a curtain-like menu.

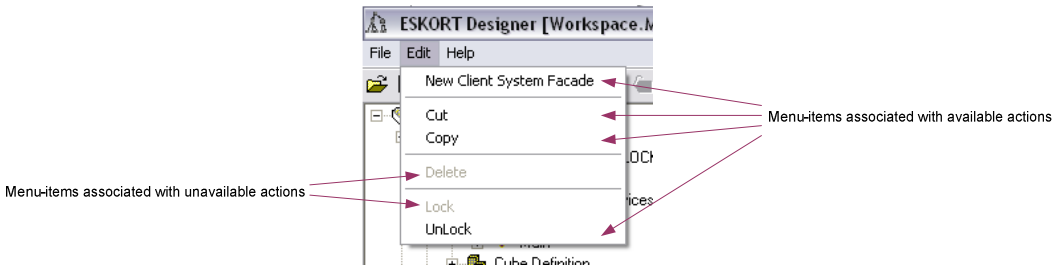
A menu-item provides access to an action that is activated when the user activates the menu-item.

Both menus and menu-items are recognised by a text and optional an icon illustrating the context.



Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

In case the action connected to a menu-item is unavailable the menu-item will be inaccessible. This can be seen as a greyed text in the menu-item.



In the ESKORT Designer the following menus and menu-items are defined.

Menu	Menu item	Action
File	Open	OpenDocument
	Open Release	OpenRelease
	Close	CloseDocument
	Save	SaveDocument
	Exit	Exit
Edit	*<EditContext>*	
	Cut	CutElement
	Copy	CopyElement
	Paste	PasteElement
	Paste as Child	PasteChildElement
	Paste as Sibling	PasteSiblingElement
	Paste as Replacement	ReplaceElement
	Delete	DeleteElement
	Sort Siblings	Sort
	Lock	Lock
	Unlock	Unlock
Help	Contents	HelpContents
	Index	HelpIndex
	Find	HelpFind
	About ESKORT Designer	HelpAbout

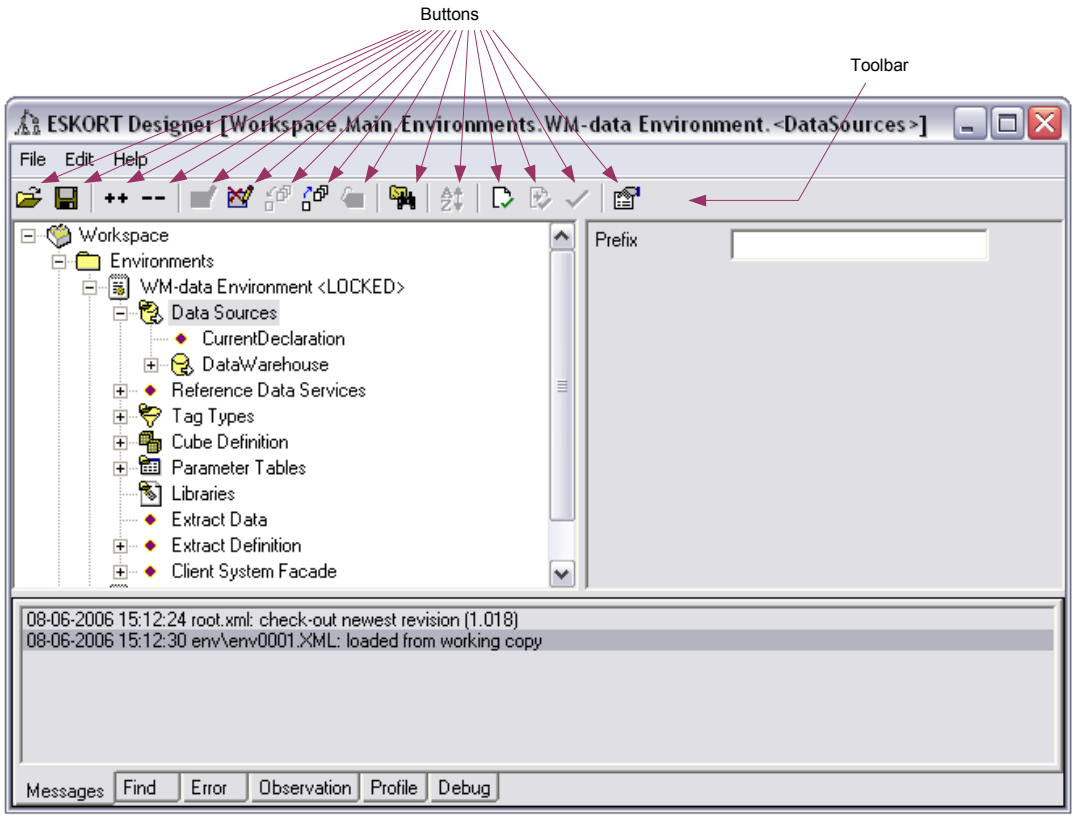
The *<EditContext>* means menu-items that dynamically changes according to the actual selection in the structure panel.

Buttons

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Typically Windows Application contains a tool-bar located just below the menu-bar. This is also the implemented in the ESKORT Designer. The tool-bar contains a number of buttons each associated with an action. A button provides access to the associated action that is activated when the user clicks the button.

Holding the mouse pointer over a button in the tool-bar shows a little yellow banner containing a small description of the associated action – this is known as tool-tip.



In case the action connected to a button is unavailable the button will be greyed out and will not be accessible.

In the ESKORT Designer the following tool-bar buttons are defined.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Button	Tool-tip	Action
	Open document	OpenDocument
	Save document	SaveDocument
	Expand all children	Expand
	Collapse all children	Collapse
	Create work copy and lock document	Lock
	Discard work copy and unlock document	Unlock
	Retrieve document revision	RetrieveDocumentRevision
	Save work copy as new revision	SaveAsNewRevision
	Label document	LabelDocument
	Search within selected tree	Search
	Sort siblings	Sort
	Verify document	Verify
	Verify document (all)	VerifyAll
	Verify formalization syntax	VerifySyntax
	Setup	Setup

Shortcuts

Typically Windows Application contains shortcuts. This is also the implemented in the ESKORT Designer. A shortcut is a keyboard key-combination that is associated with an action. Typing the shortcut key-combination activates the action for thereby making an easy access to the most common actions without the user has to use the mouse.

In the ESKORT Designer the following shortcuts are defined.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Key combination	Action
[Ctrl]+[S]	SaveDocument
[F1]	ContextHelp
[Ctrl]+[F4]	Exit
[Ctrl]+[C]	CopyToClipboard
[Ctrl]+[Insert]	CopyToClipboard
[Ctrl]+[V]	PasteFromClipboard
[Shift]+[Insert]	PasteFromClipboard
[Ctrl]+[X]	CutToClipboard
[Ctrl]+[Z]	Undo

Actions

The previous sections referred to actions. The actions are described in the table below.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Action	Menu-item	Tool-button	Shortcut	Description
CloseDocument	File/Close			Closes the current open document.
Collapse		--		In the structure panel all the child-elements to the currently selected element are collapsed
ContextHelp			[F1]	Open the context sensitive help, i.e. opens the help and shows the help page describing the currently selected element or attribute
CopyElement	Edit/Copy			Copies the currently selected element in the structure panel to the clipboard
CutElement	Edit/Cut			Moves the currently selected element in the structure panel to the clipboard
DeleteElement	Edit/Delete			Deletes the currently selected element in the structure panel
Exit	File/Exit		[Ctrl]+[F4]	Exits the ESKORT Designer application
Expand		++		In the structure panel all the child-elements to the currently selected element are expanded
HelpAbout	Help/About			Opens a dialog in which the version of the ESKORT Designer can be identified as well as copyright information.
HelpContents	Help/Contents			Open the online help at on page displaying the contents of the online help
HelpFind	Help/Find			Opens the online help on a page ready for a free text search
HelpIndex	Help/Index			Open the online help on a page prepared it for an indexed topic search
LabelDocument				Opens a dialog in which the user is capable of label the current selected environment or knowledgebase. In addition the user is also made capable of deleting previous labelled revisions.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Action	Menu-item	Tool-button	Shortcut	Description
Lock	Edit/Lock			Locks the currently selected environment or knowledge base. After this the user is made capable of modifying the contents.
OpenDocument	File/Open			Opens a dialog through which the user can select an XML-file and load it into the ESKORT Designer
OpenRelease	File/Open Release			Opens a dialog through which the user can select a released XML-file and load it into the ESKORT Designer
PasteElement	Edit/Paste			Inserts a copy of the element contained on the clipboard as a child or a sibling to the currently selected element. The action is only available in case the location at which the element can be inserted is unambiguous
PasteChildElement				Inserts a copy of the element contained on the clipboard as a child to the currently selected element. The action is only available in case the location at which the element can be either a child or a sibling
PasteSiblingElement				Inserts a copy of the element contained on the clipboard as a sibling to the currently selected element. The action is only available in case the location at which the element can be either a child or a sibling
ReplaceElement	Edit/Paste as Replacement			Replaces the currently selected element with the element contained on the clipboard
RetrieveDocumentRevision				Opens a dialog from which the user is able to select a specific revision or labelled revision of the document and subsequently load the document into the ESKORT Designer
SaveAsNewRevision				Stores the currently locked document as a new revision and subsequently releases the lock

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Action	Menu-item	Tool-button	Shortcut	Description
SaveDocument	File/Save		[Ctrl]+[S]	Saves the current opened workcopy
Search				Searches the current selected element and all it's sub-element for a user defined text
Setup				Opens a dialog in which the user is capable of selecting a set of test data
Sort				This action is only available if the currently selected element and all it's sibling-elements can be sorted. On activation the sibling-elements are sorted
Unlock	Edit/Unlock			Unlocks and discards all the changes made in the current work copy
Verify				Verifies the current selected element
VerifyAll				Verifies all elements
VerifySyntax				Verifies the formalization syntax of the selected element (if any)
CopyToClipboard			[Ctrl]+[C] or [Ctrl]+[Insert]	Copies the selected text into the clipboard
PasteFromClipboard			[Ctrl]+[V] or [Shift]+[Insert]	Paste the text contained on the clipboard into the current selected location
CutToClipboard			[Ctrl]+[X]	Cuts the selected text into the clipboard
Undo			[Ctrl]+[Z]	Undoes the previous operation

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Appendix B: Configuration Examples

In the following a number of configuration examples are listed and these represent typical configuration issues for which the Designer can be used. Each example contains a number of steps that must be taken in the listed order and it is assumed that the Designer already is started. When the last step for each example has been executed it is necessary to publish the new configuration in order to let the changes take effect in the Clearance Workbench. Before publishing it is recommended that the configuration is saved.

How to Change Names

Changing Tab Names

1. Expand the Environments, Setup nodes, Parameter Tables and Client Control Workspaces nodes.
2. Select the Tab: Compliant List node.
3. In the Tab Title box enter My at the very beginning.
4. Repeat the process for the other tabs.

Changing Column Names

1. Expand the Environments, Setup nodes, Parameter Tables and Parameter Table: randomselection nodes.
2. Fully expand the Value Column: subject node and select List View Column: Keyword.
3. In the Title box enter My in front of Keyword.

Changing Names in Filter Areas

1. Expand the Environments, Setup nodes, Parameter Tables and Parameter Table: riskobjectcountry, Value Column: riskvalueexport, Client Control, Search Filters and Set Filter nodes.
2. Select the Multi Select Field item.
3. In the Title box enter Select in front of Export.

How to Change Default Values

Changing Default Values for Result Tables

1. Expand the Environments, Setup nodes, Parameter Tables, Parameter Table: resulttable, Value Column: lowtomiddle and Client Control nodes.
2. Select Default Value and change the default value to 40.
3. Repeat for middle to high value and set that to 70.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Changing Default Values for Random Selection

1. Expand the Environments, Setup nodes, Parameter Tables, Parameter Table: randomselection, Value Column: maxuncheckeditems and Client Control nodes.
2. Select Default Value and change the default value to 500.

How to Change Minimum and Maximum Values for Random Selection

1. Expand the Environments, Setup nodes, Parameter Tables, Parameter Table: randomselection, Value Column: maxuncheckeditems, Client Control and Constraints nodes.
2. Select the Min/Max Value item and change the minimum value to 999.
3. In the Simple Message box change the range to 999-9999.

How to Add a declaration Field

This example illustrates how a new declaration field can be added and made available to the Clearance Workbench. The new field will be added in the SAD.

Cube Definition

1. Expand the Cube Definition, Cubes and SadGeneralSegment nodes and then inside the SadGeneralSegment node expand the SadGenerelSegment node.
2. Right click on any of the declaration fields and select to create a new member.
3. Enter the name as b14_declarant_email, select data type as string and Extended control as set.
4. In the Client Control Information enter the name as (14b.g) Consignee E-mail, the type as STRING and tick both the tick boxes.

Extract Definition

1. Expand the Extract Definition and Record XML Source: SadGsDeclarant nodes.
2. Right click on any of the fields and select to create a new field.
3. Enter the name as businessemail and select FieldType as Text, Use as yes, DimensionName as SadGeneralSegment and MemberName as b14_declarant_email. Leave the Cell overwriting type empty.

How to Add a New Declaration Type

This example describes how to add a new declaration type and make it available to the Clearance Workbench. The new type will be an import declaration and it is based on the SAD.

Tag Types

1. Expand the Environments and Setup nodes.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

2. Expand the Tag Types node to display the Import details – the H and I import declaration types.
3. Right click on the Import node and select to create a new TemplateGroup as a child. Alternatively you can right click on any of the existing declaration type node and select to create a new TemplateGroup as a sibling. In the name box enter the name for the new declaration type as "(X) Special Import". Leave the thresholds empty.
4. Right click on the new node and select to create a new ConditionCode as a child. Copy the condition code from one of the other import declaration types and paste into the new condition box. Change the condition text to the following:

   SadItem:'BullDeclType' = "X" and (traprule_customs_office = "IEDUB999" or traprule_customs_office = SadGeneralSegment:'boxa_office_code')

Cube Definition

1. Expand the Cube Definition, Cubes and SadItem nodes and right click on one of the items at the bottom of the SadItem node. Select to create a new template info item.
2. Enter "Item" as name and "for (Items)" as for-clause. Open the group drop-down box and select (X) Special Import.
3. Expand the SadIsSystemFields node and right click on one of the system fields at the bottom of the node. Select to create a new template info item.
4. Enter "System Fields (Item)" as name and "for (Items)" as for-clause. Open the group drop-down box and select (X) Special Import.

Knowledgebase – DetermineBullDeclarationType

1. Expand the Knowledge Bases node and lock the document.
2. Expand the Sad node in the Knowledgebase node and select the DetermineBullDeclarationType item.
3. In the Formalization tab add the following text below the last "when a = ….":

   when a = "36" then "X"

Knowledgebase – Sad_RiskObject

1. Expand the Sad_RiskObject node and select the RiskScore_HIJ item.
2. In the name box (

) add an X at the end.
3. At the end of the line BullDeclType @ " 'H', 'I', 'J' " in the Formalization tab add an X. Please observe that it has to be inside single quotes and separated by a comma from the J. The string must end with a double quote.

Knowledgebase – SadItems_DefaultValues

1. Expand the Sad_Algorithm node and select the SadItems_DefaultValues item.
2. In the Formalization tab scroll down to locate the blocking area and add an X behind the " 'E'-'K' ".Please observe that it has to be inside single quotes and separated by a comma from the K. The string must end with a double quote.

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence

Simple Map Data Reference

1. Expand the Environments, the Setup, the Reference Data Services, the Simple Map Data Reference and the Data Set: BullDeclaration Types nodes.
2. Right click on the Manifest item and select New MappedValue.
3. Enter an X in the Key box and the following in the Value box:

Import: (X) Special Import

Copyright © 2010 Intracom IT Services Danmark A/S - All Rights Reserved
Commercial in Confidence